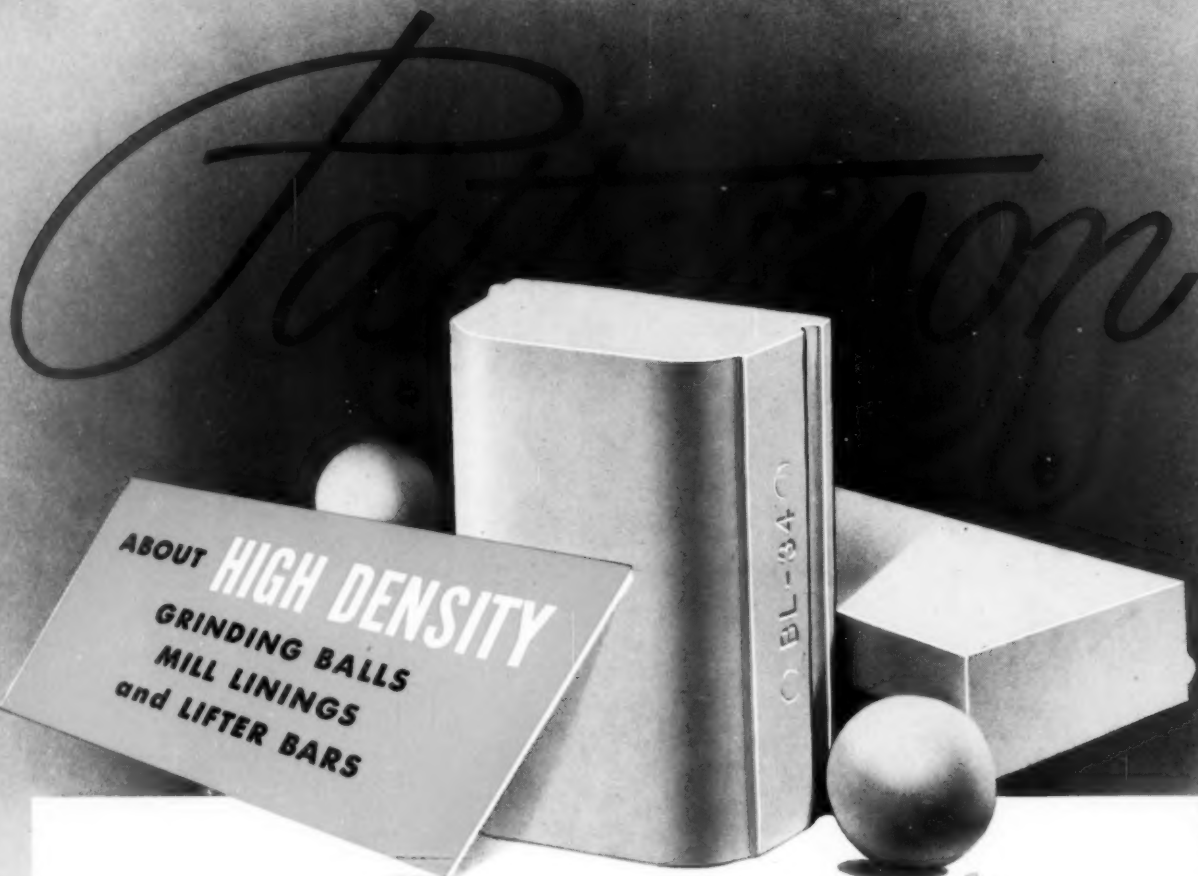


*April • 1956*

# Finish

THE MAGAZINE OF  
*Appliance* AND  
Metal Products MANUFACTURING

FROM RAW METAL TO FINISHED PRODUCT



ABOUT **HIGH DENSITY**  
GRINDING BALLS  
MILL LININGS  
and LIFTER BARS

**IT'S GOOD TO BE** *First*  
**—AND EVEN BETTER TO BE** *Best*

**ON BOTH COUNTS, WE KNOW!**

ARLCITE—the first commercially produced high-density linings and grinding balls . . . ARLCITE—longer-lasting high density grinding media—leads the field in performance today.

The first application of Lifter Bars in high density linings for ball and pebble mills is another Patterson achievement.

These facts speak for Patterson's research

and development in better grinding for all industry. ARLCITE's performance speaks for itself.

You want the ultimate in high speed grinding, economy and endurance. So, specify ARLCITE—first on the scene, and longest on the job!

*Richard L. Conway*  
President



**The Patterson Foundry and Machine Company**  
East Liverpool, Ohio, U. S. A.

NEW YORK, BOSTON, BALTIMORE, PHILADELPHIA, PITTSBURGH, DETROIT, CINCINNATI,  
ATLANTA, CHICAGO, ST. LOUIS, HOUSTON, DENVER, LOS ANGELES, SAN FRANCISCO,  
SEATTLE

**The Patterson Foundry and Machine Company, (Canada) Limited**  
Toronto, Canada  
MONTREAL

**ARMCO STEEL CORPORATION**

1136 Curtis Street, Middletown, Ohio

Please send me a copy of "Stainless Fabricating Tips."

We manufacture \_\_\_\_\_

Name \_\_\_\_\_

Firm \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

Stainless steel for built-in kitchen appliances, sinks and counter tops blends well with any style kitchen. Here, it lends charm to this early American kitchen.

Armco Stainless Steel adds character to any style kitchen, from early American to the most modern. That's only one reason why so many home-owners prefer this versatile metal for sinks, work surfaces and built-in kitchen appliances of all kinds.

Stainless resists heat, doesn't dent easily, doesn't tarnish. It's easy to keep clean, stays bright and attractive. Because it's solid stainless steel, there's no



## Give your appliances Distinctive Character with **ARMCO STAINLESS STEEL**

plating to wear off. In short, stainless means added sales appeal for your products.

### EASY TO FABRICATE

With a few modifications, Armco Stainless Steel can be fabricated with the same equipment you use for carbon steel. Our engineers will gladly consult with you about adapting your present equipment to the fabrication of stainless steel.

When you redesign your kitchen appliances, consider this handsome metal that can add distinctive character and new sales appeal to your products.

For complete information on how to fabricate and finish Armco Stainless Steel, just fill in and mail the coupon.

**ARMCO STEEL CORPORATION**

1136 CURTIS STREET, MIDDLETOWN, OHIO



SHEFFIELD STEEL DIVISION • ARMCO DRAINAGE &amp; METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION



## AT LAST! A low-foaming spray cleaner for your porcelain-enamel line!

### **PENNSALT CLEANER 38 eliminates emulsion-cleaner combinations**

Here's a brand-new low-foaming spray detergent that *works!* With new Pennsalt Cleaner 38 you can get the benefit of today's wetting agents in your spray-cycle equipment on the porcelain-enamel line; yet you do away with foam problems and with costly emulsion-cleaner combinations.

PENNSALT CLEANER 38 is completely *different* from other compounds. Without the foaming characteristic of other spray cleaners, 38 removes drawing lubricants and shop grimes never before thought movable. A delicate balance of wetting agents and high-alkali detergents in Cleaner 38 allows the use of this *one* low-cost spray cleaner . . . improves the quality of your work . . .

actually cuts your costs lower than you may have hoped for.

**WATCH 38 WORK** in *your* porcelain-enameling line! Call your Pennsalt man to arrange a demonstration, or write Metal Processing Dept. 247, Pennsylvania Salt Manufacturing Company. East: Three Penn Center Plaza, Philadelphia 2, Pa.; West: Woolsey Bldg., 2168 Shattuck Ave., Berkeley 4, Calif. In Canada: Pennsalt Chemicals of Canada, Hamilton, Ontario.



Metal Cleaners • Phosphate Coatings • Cold-Working Lubricants

A B E T T E R S T A R T F O R Y O U R F I N I S H



April • 1956

VOL. 13 • NO. 4

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**finish**

### MONTHLY TRADE PUBLICATION

Established January 1944

Published by

### DANA CHASE PUBLICATIONS

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Telephone • TErrace 4-5280  
TErrace 4-5281

A trade publication devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. The editorial scope covers design, engineering, market and statistical information and technical and practical information on plant facilities and all phases of manufacturing "from raw metal to finished product."

Free controlled circulation to top management, purchasing, engineering and key plant management and supervision in metal product manufacturing plants. To others, subscription price is \$5.00 per year, domestic. To all other countries \$8.00 per year (U.S. funds).

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NBP

# finish

**METAL PRODUCTS MANUFACTURING  
FROM RAW METAL TO FINISHED PRODUCT**

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# BROWN

*another*

**PERMA  
•VIEW•**

*user*



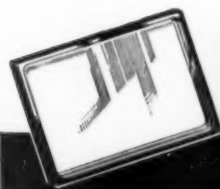
This 1956 model range manufactured by Brown Stove Works, Inc., Cleveland, Tennessee incorporates the Mills' PERMA-VIEW window.

Brown Stove Works, Inc., Cleveland, Tennessee, is one of the 46 leading range manufacturers now using PERMA-VIEW windows.

Forward thinking executives at Brown recognize the fact that home makers have come to expect "visible cooking" when they buy a new range. PERMA-VIEW, "the window you can see through always", is the logical answer to this demand.

The PERMA-VIEW window is pre-engineered and comes to you ready for immediate installation in your range. "Out of our carton into your door." Let our specialized production lines serve as a part of your sub-assembly facilities. Phone us at MARKET 4-2256 and we will give you complete details on the ease and economy of adding this sales feature to your new ranges.

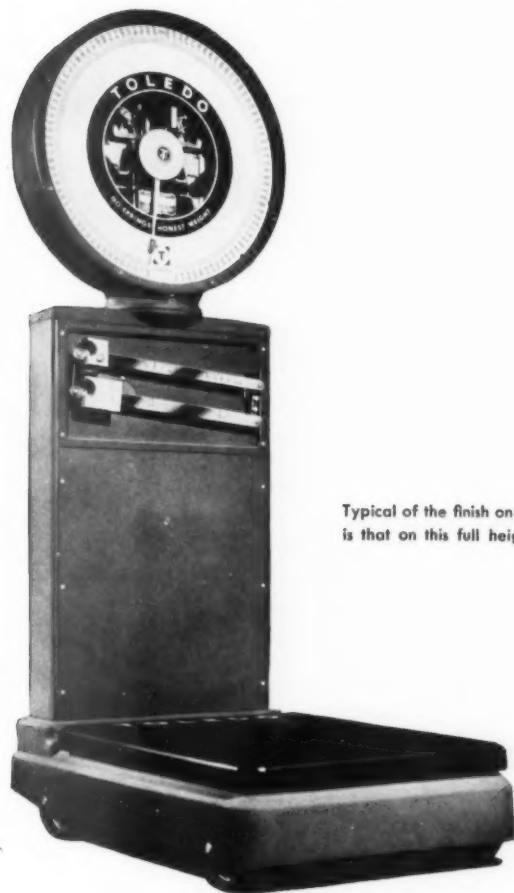
*"out of our carton — into your door"*



**MILLS PRODUCTS  
INCORPORATED**

1015 WEST MAPLE ROAD

• WALLED LAKE, MICHIGAN



Typical of the finish on all Toledo Scales is that on this full height portable unit.

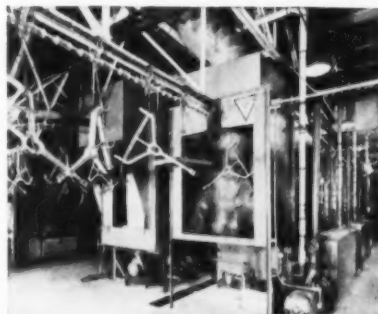
## BOTH STEEL AND ALUMINUM PARTS ARE PROCESSED IN THE SAME 6-STAGE MACHINE AT TOLEDO SCALE

Steel parts are Granodized, aluminum parts are Alodized to inhibit corrosion and provide an excellent base for the high-grade finish used on these familiar products

Toledo Scale knows that the fundamental prerequisite of a good paint job is a properly prepared base material upon which the finish is to be applied. To provide this all-important base, it Granodizes most steel parts with Granodine® and Alodizes most aluminum parts with Alodine.® Granodizing is a chemical process for the treatment of iron and steel which converts metallic surfaces to a nonmetallic coating of the proper texture for inhibiting corrosion and

greatly increasing the adhesion and durability of the paint finish. Alodizing performs the same functions on aluminum parts.

Both of these processes are performed in the same 6-stage machine. And both add to the long life of the Toledo finish. Perhaps these ACP processes can be used effectively in your plant. Complete data about both of them are available upon request. Write us.



Part of 6-stage machine in Granodizing Department at Toledo Scale Co.

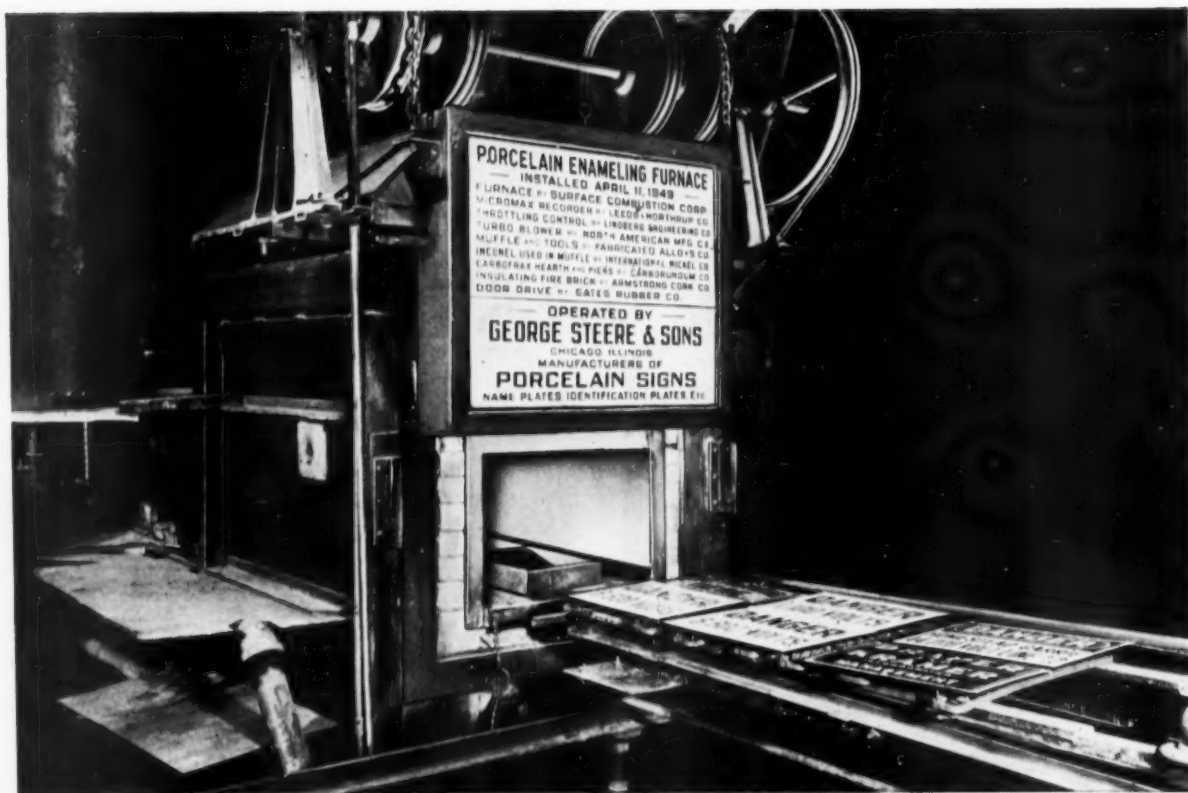
**AMERICAN CHEMICAL PAINT COMPANY, Ambler 33, Pa.**

DETROIT, MICHIGAN

NILES, CALIFORNIA

WINDSOR, ONTARIO





This furnace for firing porcelain enameled steel signs is completely shut down at night. As a result, its temperature quickly drops from a possible 1580°F to 200°F. Early the next morning, an

operator turns the valve wide open and in one hour brings the furnace up to 1100°F. But even these rapid changes in temperature never faze its 6-year-old muffle of Inconel nickel-chromium alloy.

## Inconel muffle in enameling furnace still gas-tight after 6 years

*...does away with annual rebuilding  
of muffle made of ceramic*

THINGS are a lot different now, at the Chicago plant of George Steere & Sons. Until 1949, somebody had to crawl in the furnace every few months to patch the muffle. Otherwise combustion gases reached the ware being fired. And played havoc with porcelain.

But that wasn't all. Each year, workmen had to tear out the entire muffle. Then build a complete new unit. With shutdowns lasting 10 to 14 days, you can imagine the production losses.

Today nobody ever climbs in and out to patch the muffle . . . to tear it down or build it up. Because the muffle you see up there is made of Inconel® nickel-chromium alloy.

In fact, ever since Steere & Sons installed this larger furnace in 1949, its

Inconel muffle has earned plenty of profit. And it's still in use today . . . good and gas-tight after more than six years of continuous use.

### **Inconel answers many demands**

Where you apply high temperature ceramic coatings . . . or wherever equipment of any sort needs great strength to meet severe conditions of heat and corrosion . . . use Inconel nickel-chromium alloy.

This nickel-chromium alloy retains a high degree of strength at high temperatures. It resists damage

by oxidation, carburization and other forms of high temperature attack. It also resists grain growth, withstands thermal shock, and in many applications, retains useful properties to 2100°F and over.

What's more, you can form, machine and weld Inconel . . . a nickel-chromium alloy available in all commercial wrought forms. So write for the useful, free booklet, "Keep Operating Costs Down as Temperatures Go Up." Send for *your* copy now and see how Inconel can save you money.

**The International Nickel Company, Inc.**  
67 Wall Street New York 5, N. Y.

\*Registered Trademark



**Nickel Alloys**

**Inconel** . . . for long life at high temperatures

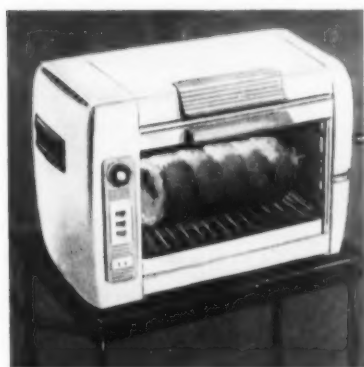


# How to make these three appliances more modern

THE consumer demand for small appliances that are both more efficient and more beautiful has created important new applications for aluminum.

Many manufacturers now specify Kaiser Aluminum

to give their appliances selling features that no other material can match—plus major production economies. Aluminum is extremely workable, economical to fabricate, and requires no further treatment for decorative or protective purposes.



**Portable Rotisseries** made with Kaiser Aluminum will be more efficient because aluminum reflects heat as no other material can. And because aluminum is so light in weight, the unit will be easier to move and cost less to ship. Exteriors may soon be anodized in a variety of colors for outstanding beauty.



**Portable Mixers** made with Kaiser Aluminum will be *truly* portable, thanks to aluminum's light weight—about one-third as much as brass, copper or steel. Aluminum is also strong and durable to give years of trouble-free service. And it's rust-proof and easy to clean.



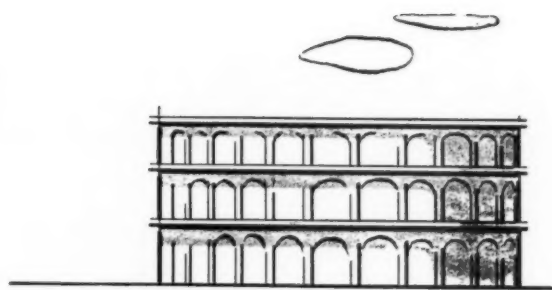
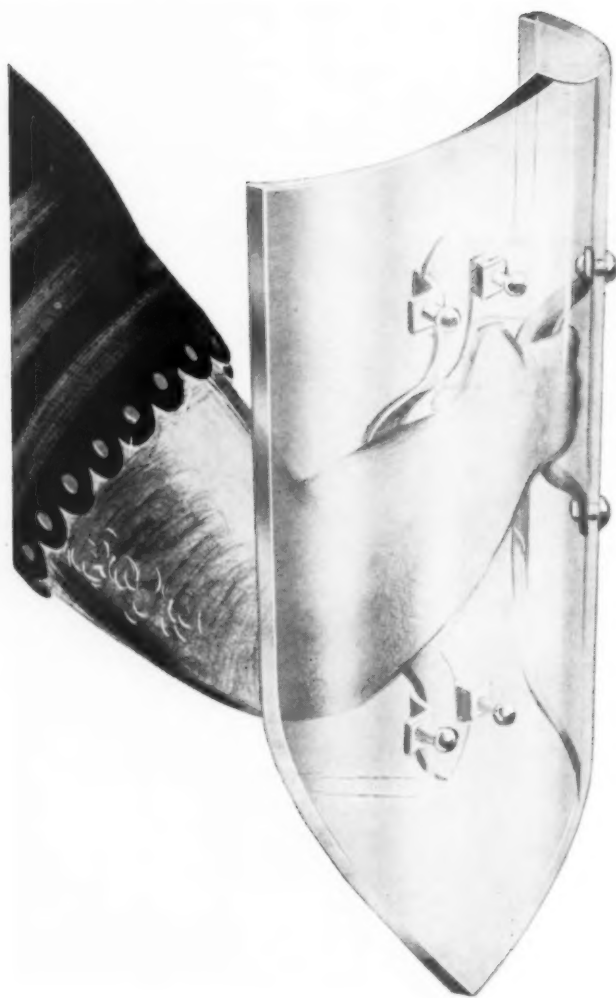
**Toasters** made of Kaiser Aluminum will have an inner surface that has high heat reflectivity. Thus, the toaster will operate more quickly, with a more uniform distribution of heat. In addition, aluminum may be colorfully anodized or porcelain enameled to harmonize with kitchen or dining area.

INVESTIGATE these important ideas for your new small appliance designs without delay. Benefit from aluminum's unique combination of advantages, including: light weight with strength, thermal conductivity, electrical conductivity, heat and light reflectivity, corrosion resistance, handsome appearance, non-toxicity, ease of fabrication, economy.

An experienced Kaiser Aluminum design engineer will be glad to work with you immediately, at your request. Contact any Kaiser Aluminum sales office listed in your phone directory. Kaiser Aluminum & Chemical Sales, Inc. *General Sales Office*, Palmolive Bldg., Chicago 11, Illinois; *Executive Office*, Kaiser Bldg., Oakland 12, California.

## Kaiser Aluminum

setting the pace—in growth, quality and service



## **this *Glass* shield, while symbolic,**

represents some of the things a master craftsman can do with glass. It can be bowed to fit any desired shape, it can be drilled and shaped to exact tolerances.

It can be tempered to impart extreme resistance to impact — that is why safety regulations demand glass as a safety barrier when danger exists.

Let glass improve the utility of your product while it beautifies it.



*Let Marsco's craftsmen-engineering team  
impart to your product all the advantages of glass*

**Marsco**

**MARSCO MFG. CO., 2909 S. HALSTED ST., CHICAGO 8, ILL.**

**Here are some of the applications for Marsco heat-treated, tempered and hardened glass parts:**

- CLOCK & TIMER CRYSTALS
- OVEN DOORS
- RADAR EQUIPMENT
- AIRCRAFT ACCESSORIES
- PHOTOGRAPHIC EQUIPMENT
- LIGHT LENSES
- DIALS & NAME PLATES
- TELEVISION EQUIPMENT
- INSTRUMENTS
- MEDICAL EQUIPMENT

*Special shapes for: Instruments, Gauges, Household and Industrial Appliances.*



## from the Editor's Mail

### enjoyed articles on color

Gentlemen:

I was very much interested in the articles on (1) "Color" by Howard Ketcham, (2) "The Fabulous Future for Home Laundry Appliances" by Guenther Baumgart and (3) "The Special Rheem Section".

Reprints of the above articles would be appreciated for circulation.

I would appreciate being considered for addition to your controlled circulation list. . .

H. R. Ball, Mgr. of Engineering Services  
Whirlpool-Seeger Corporation  
Marion, Ohio

Fortunately we have a small supply of the January issue. Complete copies have been mailed. Your name has also been added to those now receiving *finish* at the Marion plant. Eds.

### must beg, borrow or steal *finish*

Gentlemen:

Each month I browse through your fine publication *finish*. Currently, however, I must beg, borrow or steal a copy from one of my associates here . . . I would appreciate it if you would include my name on your circulation list.

R. H. Gieser, Asst. to Director of Research & Development  
Rheem Manufacturing Company  
Chicago, Illinois

### already sure of *finish*'s value

Gentlemen:

We would very much appreciate your courtesy in placing us on your mailing list to receive *finish*.

The current February issue, which we obtained at a client's office, is of particular interest because we are currently working on a long term redesign project for a western stove manufacturer.

I am quite sure each issue contains material of interest and usefulness in our work for many clients.

Harry R. Greene  
Merendino-Greene Industrial Designers  
Pasadena, Calif.

We have a small selected list of designers specializing in appliances and fabricated metal products on our complimentary subscription list. Your name has been added to take effect with the March issue. — Eds.

### tears out important articles

Gentlemen:

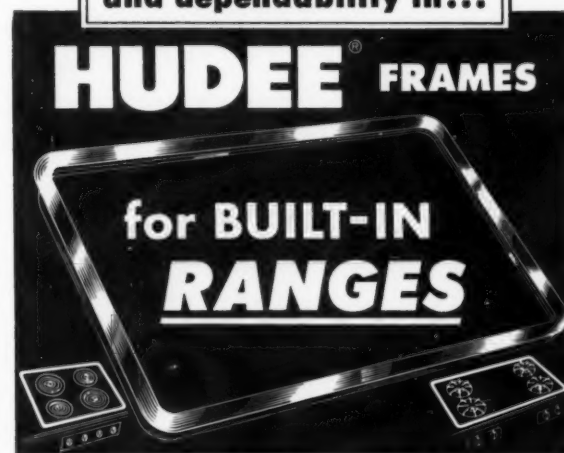
I would appreciate your sending *finish* to Mr. Burton Felder, Assistant Range Engineer. . . He should see your publication regularly, but I frequently find it desirable to tear out important articles from my own copy, making it inadequate to pass on to him.

R. E. Dadson  
Chief Range Engineer  
Kelvinator Division  
American Motors Corporation  
Detroit, Michigan

We gladly added Mr. Felder to our mailing list, so now you can tear up your own copy as much as you like. — Eds.

*finish* APRIL • 1956

*Now . . . an old friend  
does another important job!*



© REGISTERED TRADE MARK

Hudee, the original clamp-down frame system for built-in sink bowls, now makes Hudee frames for manufacturers of flush-type built-in ranges.

Builders, contractors, architects, craftsmen and homeowners who have made Hudee the leader in millions of sink bowl installations will appreciate the matching quality, beauty and dependability of Hudee frames for built-in ranges.

They know how important it is to get a watertight, sanitary seal between counter tops and built-in units . . . and Hudee is the one sure way to a perfect installation every time. There are no cracking, peeling, rotting counter tops . . . no grease-catching, vermin-breeding cracks and crevices with Hudee frames.

They know, too, that Hudee is easy to install—no rabbeting, scribing or special tools. They use Hudee with confidence . . . from years of experience.

PAT. NO. 2,440,741  
PAT. NO. 2,704,370

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**SELCK**  
AND COMPANY

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Good Housekeeping

HUDEE IS  
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RESEARCH  
APPROVED

Send for complete information today!  
225 West Hubbard St. • Chicago 10, Illinois

IN CANADA: Walter E. Selck and Company, Ltd. • Toronto

# Try Century Vit

## TITANIUM WHITE



1. COLOR STABILITY
2. HIGH REFLECTANCE
3. HIGH OPACITY

4. GLOSS
5. TEXTURE
6. WORKABILITY

With Century Vit Titanium cover coat over Century Vit ground coat enamel you have an unbeatable combination for adding beauty and durability to your appliance or other metal product.

Century frits are time proved in production plants before they are sold to you. The titanium frits give you the six characteristics: color stability, high reflectance, high opacity, gloss, texture and workability, so important to your plant and finished product.

Then too — you will save money 1) in frit cost and 2) on the production line.

A Century field engineer can show you how to improve your product and save money too if you will let us hear from you now.



### CENTURY VITREOUS ENAMEL COMPANY

6641-61 S. Narragansett Ave., Chicago 38, Ill.

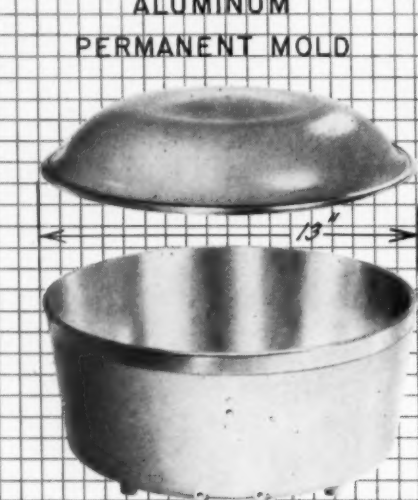


# THE finish *spotlight*

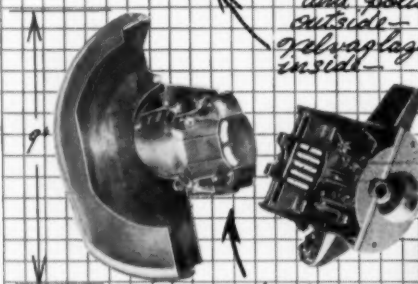


The Norge Futura Vertical Broiler Electric Range broils both sides of a cut of meat at the same time. This new method is said to seal in juices and flavors, cut shrinkage and shorten cooking time; frozen meats require only five minutes of pre-heating before broiling. A chart fused on the door liner provides information about broiling time and heat settings. This 36-inch range is available in white, pink, green and yellow.

# ALUMINUM PERMANENT MOLD



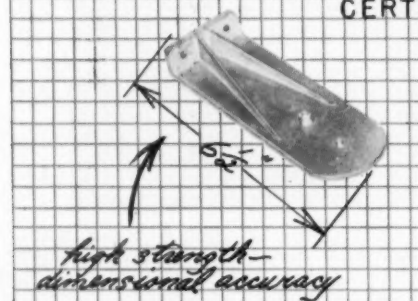
*Cast in element,  
colored porcelain  
and polished  
outside—  
Velvagleze finish  
inside—*



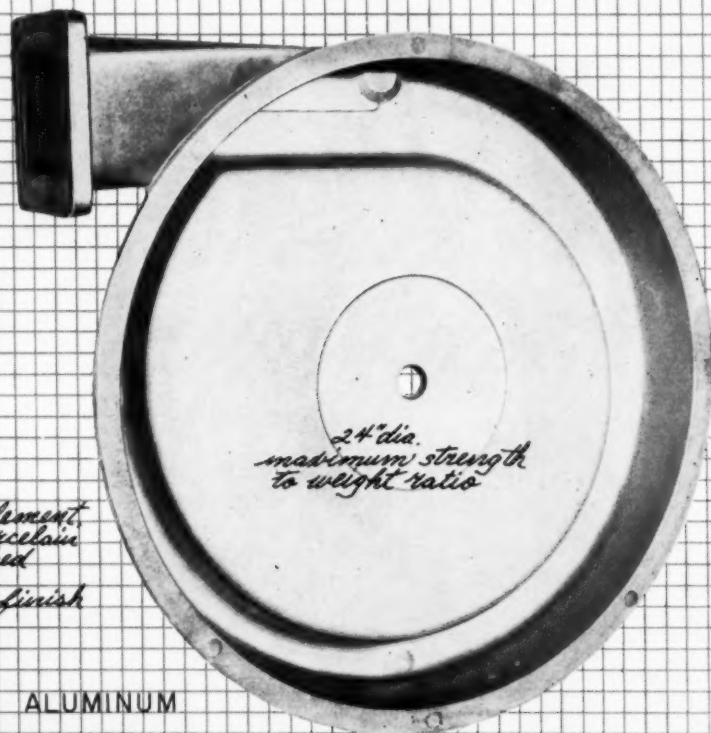
*2 units of  
multiple assembly  
Durable in extensive  
Velvagleze castings*



*Turbine  
housing cast  
in 2 parts fully  
machined and  
Velvagleze finished*



*high strength—  
dimensional accuracy*



# ALUMINUM DIE CASTINGS

How can you get

## MORE CASTING VALUE PER DOLLAR

Monarch pioneers in casting progress. Exclusive developments such as continuous-melt furnaces, porcelain-enamel on castings, and Velvagleze<sup>®</sup> are your means for improving product performance and lowering end-cost.

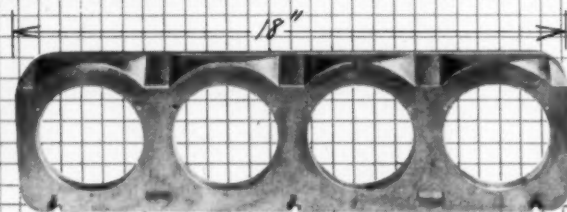
Monarch Aluminum permanent mold and aluminum and zinc die castings are custom engineered to meet your total requirements. Send for new brochure, "Monarch Pioneers in Casting Progress".

**MONARCH  
ALUMINUM**  
PIONEERS IN CASTING PROGRESS

## MONARCH ALUMINUM MFG. COMPANY

9203 Detroit Avenue, Cleveland 2, Ohio

# CERTIFIED ZINC CASTINGS



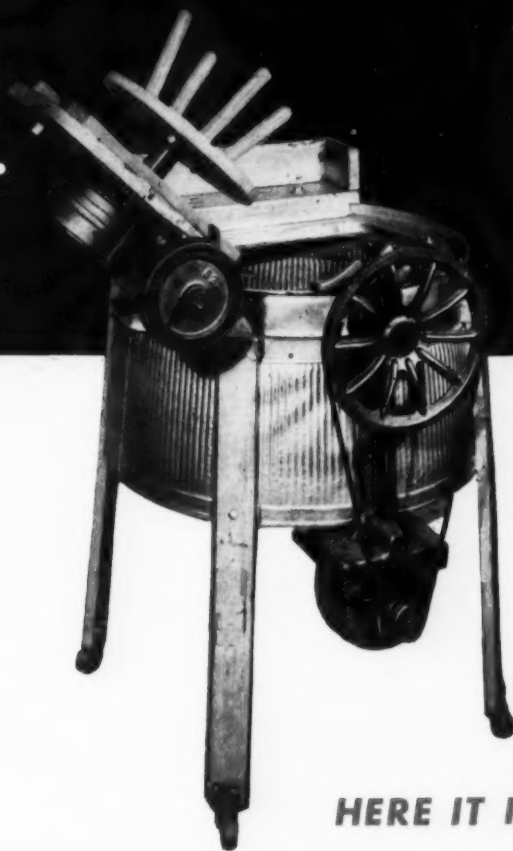
*accurately cast and machined  
for reduced assembly cost—*



**General Electric announces...**

# **THE MOST IMPORTANT DEVELOPMENT IN APPLIANCE MOTORS**

**since washers looked like this...**



**NEW POWER FOR WASHERS, DRYERS, DISHWASHERS,  
IRONERS, AND FOOD WASTE DISPOSERS**

This washing machine—one of the first steps away from the hand-crank—doesn't bear much resemblance to its present-day offspring. But the motors which power today's washers are essentially the same as they were 25 years ago. True, refinements have been made from time to time. But now, for the first time, *all* the new materials and engineering improvements of the past 25 years have been combined into one integrated design—the entirely new G-E appliance motor!

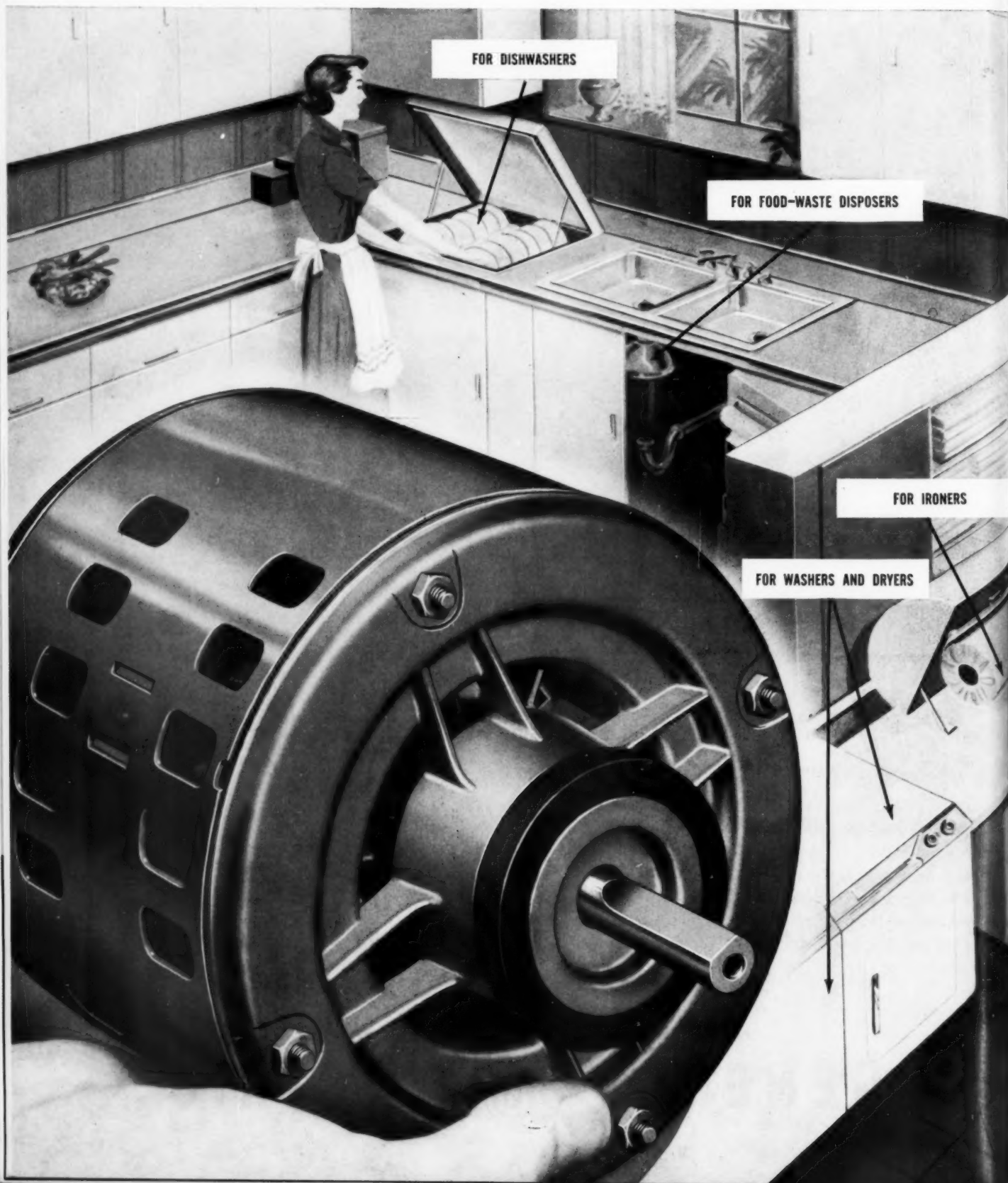
**HERE IT IS** 

**GENERAL  ELECTRIC**



NEW G-E APPLIANCE MOTOR...

# Designed Specifically for





# for Modern Appliances

*... and built by appliance motor specialists who give 100% attention to problems and requirements of appliance manufacturers*

An entire General Electric department, in De Kalb, Illinois, is devoted exclusively to appliance-motor design and manufacture. Right now, finishing touches are being put on new plant facilities for high-volume production of a new motor for washers, dryers, dishwashers, and food waste disposers.

This new General Electric appliance motor was designed to a rigid set of specifications: to help you cut down appliance assembly costs, improve appliance performance, and heighten your customers' satisfaction.

A few of the new and exclusive features of the new G-E motor: Mylar\* insulation (35 times greater moisture resistance, 8 times tougher); 24% lighter weight for easier handling; 5 times better ventilation to assure longer life; and a 64% larger terminal board to make hookup easier.

At General Electric, you will find real understanding of your problems—and the best motor yet designed for your products. For more information, contact your G-E Apparatus Sales representative, or write for Bulletin GEA-6381. General Electric Co., Schenectady 5, N. Y. 703-2

*Progress Is Our Most Important Product*

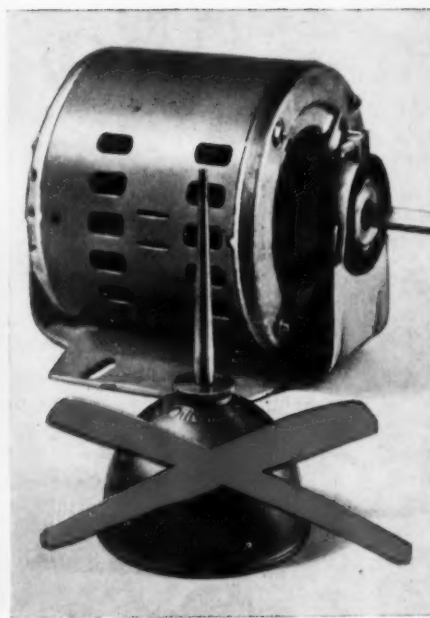
GENERAL  ELECTRIC



**24% LIGHTER**,  $\frac{1}{2}$ " shorter per rating—saves space, makes handling easier. However, it is completely interchangeable, both electrically and mechanically.



**VASTLY IMPROVED INSULATION** of Mylar\* polyester film (right) has 35 times greater resistance to moisture and humidity than conventional insulation (left).



**BEARINGS NEED NO OILING** because of completely sealed design and large oil reservoirs. You install the new G-E motor—your customers can forget it!

\*DuPont trademark for polyester film.



## MACCO'S NEW PLANT and MODERN FACILITIES ARE MATCHED

*by a Staff of Unexcelled Craftsmen*

Starting in 1931, with a unique idea for producing specialized metal-working compounds, Macco today—25 years later—has achieved a position of unquestioned leadership in its field.

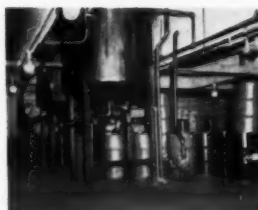
The newest and most modern manufacturing and storage facilities—a thoroughly modern and complete research, quality-control and analytical laboratory—a staff of highly trained sales engineers and skilled technicians ready to work with you in the solution of your specific metal-working problems—this is the well-rounded Macco combination that has been meeting the challenge of its customers' requirements these many years.

Macco is founded on the idea of *working for you*, producing at lowest cost metal cutting, drawing and cleaning compounds that will help you to increase production and maintain departmental harmony in your plant.

When a particularly difficult metal-working problem turns up, call for a Macco sales engineer. Let us prove to you on your own floor that Macco offers you a service that is truly hard to beat.



Modern Laboratory



Explosion-Proof  
Compounding Room



Scientific Testing



Write today or call a Macco sales engineer

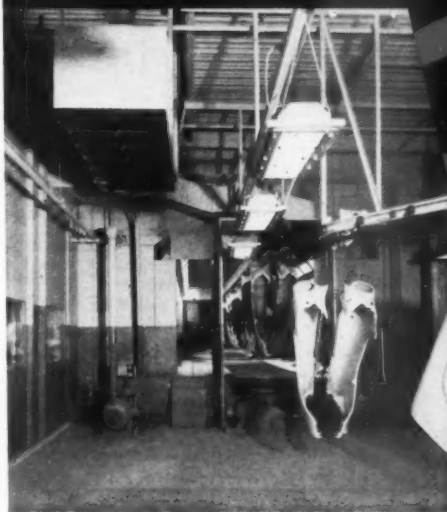


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# COMPLETE

# Finishing SYSTEMS

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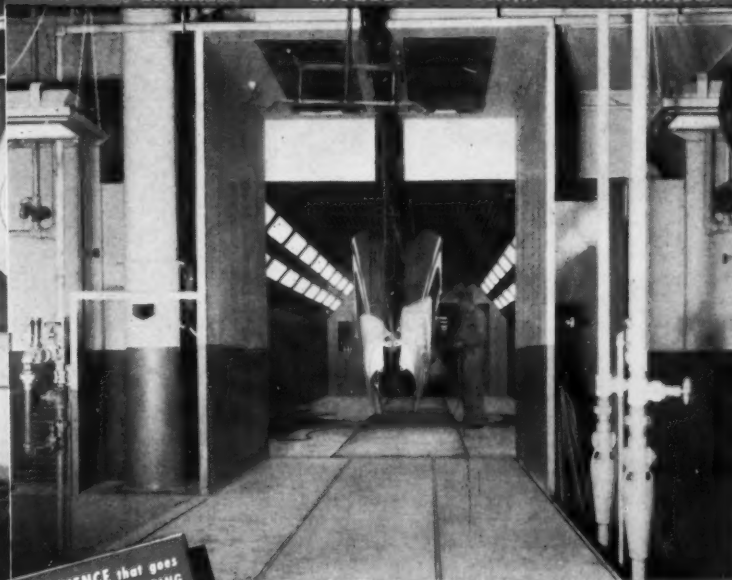
Mahon ventilated Flash-Off Enclosure between Hydro-Filter Spray Booth and the Finish Baking Oven on the roof above.



Mahon filtered Air Supply System and Mahon Finish Baking Oven installed on the roof of the plant.



Interior of Mahon Air Supply System showing one bank of Filters of the Air Filtering Equipment and the Direct Gas-Fired Air Preheating Unit.



Mahon Down-Draft Hydro-Filter Spray Booth specially designed to accommodate a variety of automobile parts other than body parts.

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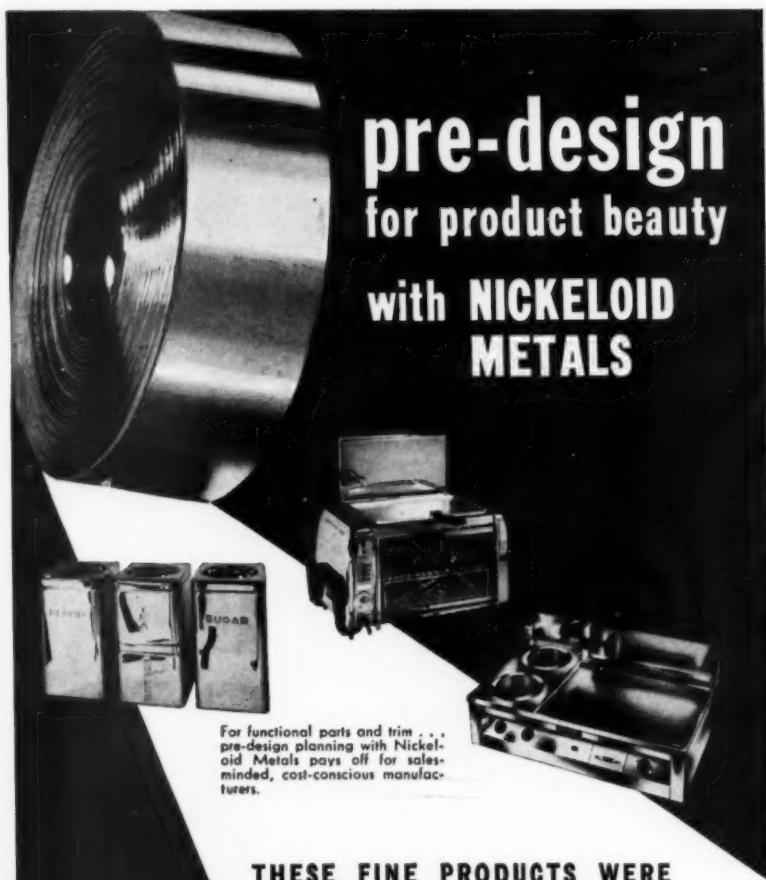
To meet requirements in this particular installation, where floor space was a restricting factor, Mahon engineers built the space-consuming units of the finishing system on the roof of the plant. This is not unusual . . . today, Mahon can point to hundreds of installations in which major parts or entire finishing systems have been built and housed on the roof of plants where floor space inside the plant was at a premium. If you are contemplating new finishing equipment, you, too, will want to discuss methods, equipment requirements and possible arrangements with Mahon engineers. You will find them better qualified to advise you, and better qualified to do the all-important planning, engineering and coordinating of equipment which is the key to fine finishes at minimum cost. And, if you care to investigate, you will find that Mahon equipment will serve you better . . . because, Mahon equipment is engineered better and built better for more economical operation over a longer period of time. See Mahon's Insert in Sweet's Plant Engineering File, or write for Catalog A-656. Better still, why not have a Mahon engineer call at your convenience.

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SALES-ENGINEERING OFFICES in DETROIT, NEW YORK and CHICAGO

Engineers and Manufacturers of Complete Finishing Systems—including Metal Cleaning, Pickling and Rust Proofing Equipment, Hydro-Filter Spray Booths, Dip and Flow Coaters, Filtered Air Supply Systems, Drying and Baking Ovens, Cooling Tunnels, Heat Treating and Quenching Equipment for Aluminum and Magnesium, and other Units of Special Production Equipment.

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## MEETINGS

### APPLIANCE TECHNICAL CONFERENCE

American Institute of Electrical Engineers, 7th Annual Appliance Technical Conference, Wisconsin Hotel, Milwaukee, May 14-15.

### AIR CONDITIONING & REFRIGERATION INSTITUTE ANNUAL MEETING

Air Conditioning and Refrigeration Institute, Annual Meeting, The Homestead, Hot Springs, Va., May 7-9.

### GAMA ANNUAL MEETING

Gas Appliance Manufacturers Association, Annual Meeting, The Greenbrier, White Sulphur Springs, W. Va., April 19-21.

### CERAMIC SOCIETY MEETING

American Ceramic Society, 58th Annual Meeting, Hotel Statler, New York City, April 22-26.

### ENAMELERS CLUB MEETING

Central District Enamellers Club, plant tour of Whirlpool-Seeger, Clyde, Ohio, May 11.

### DESIGN ENGINEERING CONFERENCE & SHOW

American Society of Mechanical Engineers, Design Engineering Conference, held concurrently with Design Engineering Show, Convention Hall, Philadelphia, May 14-17.

### AWS WELDING SHOW

American Welding Society, annual welding show, Memorial Auditorium, Buffalo, N. Y., May 7-11.

### AMA PACKAGING SHOW

American Management Association, 25th National Packaging Exposition, Convention Hall, Atlantic City, N.J., April 9-12.

### BUILDING RESEARCH INSTITUTE

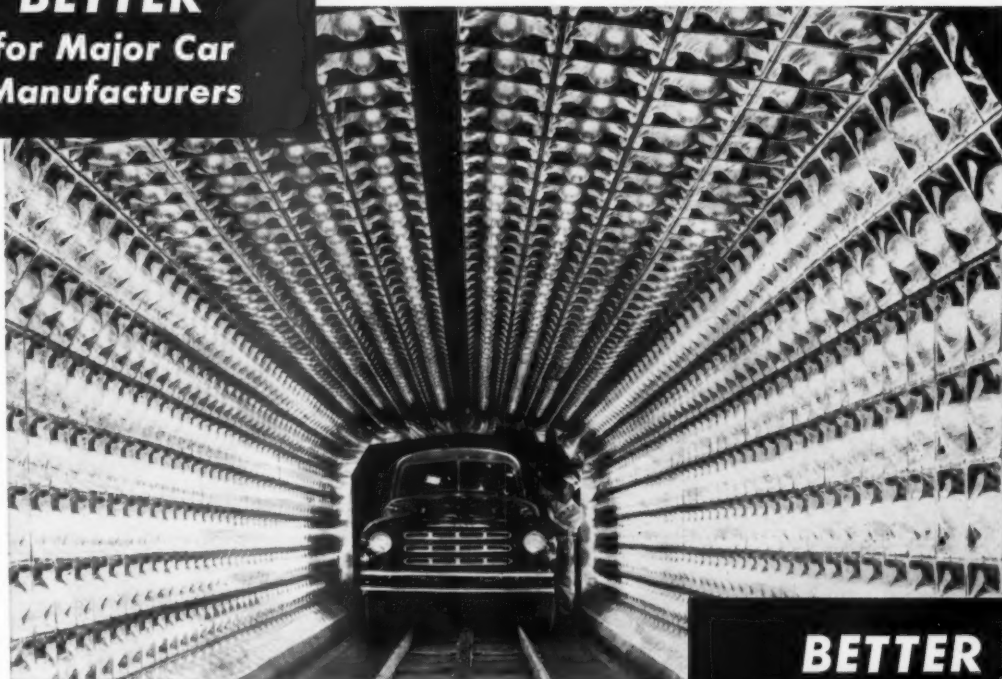
Building Research Institute, Fifth Annual Meeting, Sheraton-Brock Hotel, Niagara Falls, Ontario, Canada, May 21-22.

### INDUSTRIAL RESEARCH CONFERENCE

Armour Research Foundation, First Annual National Industrial Research Conference, Sherman Hotel, Chicago, April 18-19.



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Don't take our word for it—look what's been happening in the highly competitive automotive industry. Today, the customer list for FOSTORIA RADIANT OVENS reads like a "Who's Who" among automotive manufacturers. The list of FOSTORIA users includes *all* of the major car and truck manufacturers in this country. It also includes many automotive component part manufacturers and assembly plants overseas. These companies are ordering and re-ordering FOSTORIA Ovens...and have been for years! The reason behind FOSTORIA's position

of leadership is clear. FOSTORIA is the world's oldest and largest manufacturer of industrial infrared ovens—with unrivalled application "know-how" and experience in engineering *all three major types* of industrial infrared equipment, from components to complete ovens—Quartz Lamp, Radiant Rod and Conventional Infrared Lamp. An experienced FOSTORIA sales engineer is ready to help *you* achieve important savings with FOSTORIA RADIANT OVENS too.

Call him today and take advantage of these specialized services. There's no obligation.



Write for a free copy of "Applications Unlimited," a fact-filled booklet of cost-saving information on Radiant heating.



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is never further away than your phone

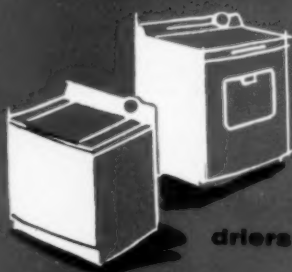
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for every specialized need



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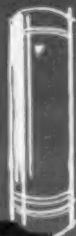


ranges



washers

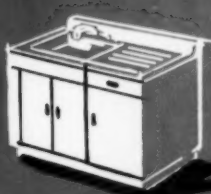
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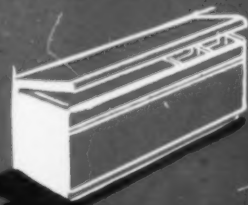
water heaters



bath-tubs

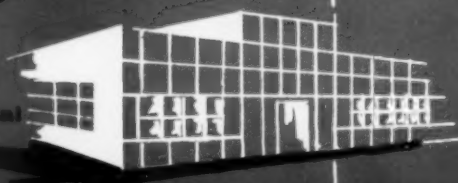


sinks



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architectural



Working side by side with enamel plant personnel is a part of Chicago Vit service that can't be measured in terms of dollars and cents. But it's important to the enamel plant operator, and it encompasses every phase of enamel processing. Chicago Vit customers have learned that this specialized service has helped them to reduce costs and increase production in many ways year in and year out. And the beauty of it all is that it's never further away than the nearest telephone.

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signs

# THE **finish** **LINE**

**REMEMBER** the Model "T" era? Well, even the Model "A". Those were the days when any boy on the block could take down a car, grind the valves himself. Why, even big sister or mother knew about the lugs on the wheels to change all those tires. Now we seldom have to change tires with the blow-out and puncture-proof ones on the market. But I defy anyone but the well-trained automobile mechanic to find a piston ring under the sealed-in hood of the modern streamlined "pushbutton cars" of today.

**ISN'T IT ABOUT TIME** that the manufacturer of appliances set up as efficient and capable a service department as the automobile manufacturers have? Surely the automobile industry wouldn't be as far along today if the man of the house called the local dealer who had sold him that Gargantua for \$4,000 and was told he had to wait until come-next-Tuesday ere he could get a man around. Father would blow his top then. He wants his car when he wants it.

**BUT ISN'T THE LITTLE WOMAN** entitled to just as much service? Come to think of it, the manufacturer with a full line of appliances has taken quite a bit of money from that little woman. A sink, an icebox, a stove were the three appliances of every kitchen of the Model "T" era — and maybe one car. Today 12% of the families have two cars, and today the well-dressed kitchen can boast of at least nine major appliances and more than twenty small appliances. Quite an investment, yes? Over \$3,000 in majors, eliminating the cabinets (add a few thousand more for those), and another thousand in small appliances if the family is gadget minded.

Not average, you say? Of course not, but doesn't the "one-small-car-family" need that car as well as the owner of the Gargantua? And believe you me, even he gets the service, for methinks Father in the small-car-family does set up that howl like Clarence Day's Father.

Mother has to account to Father for that investment in her kitchen. To be sure, sealed motors need no oil can — even once a year. But the push-button era we live in has made our mechanical contraptions so much more complicated, as well as our living less a burden — that our dependence on them can sure mean a topsy turvy household when one is out of order.

We who are in a position to be asked which washer, dryer or what-have-you to buy are apt to answer, "Buy for the service you will get."

Our guest is *American Home Magazine's* Home Equipment Editor, Edith Ramsey, — widely known

for her crusades on behalf of the American homemaker — who fires the opening gun of *finish's* new campaign for extension of services and service facilities.



**"SERVICE!" SAYS THE CONSUMER** in a horrified tone. Isn't it putting the horse before the cart where it belongs to be able to assure service? To go back to the automobile industry, that is exactly what they have done from cities and towns, to the smaller hamlets. To be sure, the car is for a higher priced item. But we reiterate, think of the package of appliances in one home! And every reliable manufacturer needs a competent Home Service Staff as much as a corps of engineers and salesmen.

**HOW CAN YOUR HOME SERVICE** Department help? We all know that one manufacturer who came out with one of the first automatics kept the machines sold through an excellent and far-reaching Home Service Department. Now the need is even greater with these full lines and:

(a) Service men must be trained on all models of appliances and the complete line.

(b) Service men should be trained on the use of products by the Home Service Department over and above technical training or construction.

(c) Service men should be familiar with instruction books — just as the homemaker should be.

(d) Publications and home service departments tell homemakers to keep instruction books on file to understand warranty, to know how to make minor repairs, i.e., change fuses, etc., in order to ease the service man's job. Service men can repeat this. So should the service man be expected to understand the homemaker's side.

**A SATISFIED USER** is one of the best sales tools. She creates customers. But "Beware the woman scorned". Her tongue is far more venomous and your good will is torn asunder should your service be not prompt, courteous, competent. And this goes for everyone in your organization. Behold the wonderful public relations of that vast system — the telephone company. Emulate it from the very first voice that answers the harried housewife's call through all the stages of getting that appliance back in working order quickly, courteously and efficiently to the follow-up call of a few days later to be sure that her kitchen is purring along as reliably as her car.

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AND IN MAY: ROPER OFFICIALS DETAIL OUT THEIR SUCCESSFUL SERVICE PROGRAM.

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# 1956 Marks our 65th Year as Manufacturer and

*and a few of our contributions thru the years*

Ever since the O. Hommel Company was founded in 1891, our customers and friends by their suggestions, cooperation and understanding, have made our progress a reality. During our first year we manufactured quality glass colors and bronze powders in our own plant. To meet the growing demand, manufacture of ceramic colors and enameling oxides was started in 1897. When a method was needed to speed up production in the application of colors, we perfected and introduced the spray gun to the ceramic industry in 1905. To help develop a larger market for enameling oxides, we started fundamental research in the development of frits for porcelain enamels in 1907 and soon after we moved to our new large plant at Carnegie. We introduced the first clays mined in America to the enameling industry during 1915. With the increased applications and use of aluminum, 1917 brought the first vitreous enamel coating for aluminum. In 1921, *American powdered Vallendar clay*, the first commercially dry processed powdered clay was made available to porcelain enamels. Squeegee oils and glass colors for the glass decorating industry were added in 1923 followed shortly after by a method to squeegee beverage bottles and tumblers. Based on successful research started in 1907, we started the manufacture

POTTERY • STEEL AND CAST IRON FRIT C



# Supplier to these industries

PORCELAIN ENAMEL • GLASS • POTTERY  
TILE • DINNERWARE • INORGANIC PIGMENT...

of porcelain enamel frit during 1925. Simultaneously, production of pottery frit in a separate new plant was started. "HOMELAYA", a white cover coat frit that could be applied directly to steel was given to the enameler in 1929 and soon after our first patents were issued and manufacturing was started on a titanium white cover coat frit *which we introduced* as "TITE-WITE".

The Mellon Institute Fellowship for basic research in ceramics was established in 1933. Other developments that followed in rapid succession up to World War II included a pottery glaze effect on porcelain enamel, a cup banding machine, a crinkle finish porcelain enamel and "Supersoft" ground coat frit for high speed production. 1946 introduced silica fibre frits followed by low temperature enamels and the Hot Squeegee Machine that greatly increased production in the glass decorating industry. XLT emerged from the research laboratory in 1955, a new miracle for steel products that will greatly expand many ceramic markets.

We look forward to extending a warm welcome to our many friends at the A.C.S. Convention in the Hommel Hospitality Suite.

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CERAMIC COLORS • CHEMICALS • SUPPLIES

## Performance Report on the Flying Press-



400 aluminum E's plates every minute. Of .002" gauge stock, these were formerly pressed at 110 per minute on conventional equipment.

Window channel molding production doubled as Wean Flying Press gives manufacturer 200 feet per minute.

400 E's and I's every minute instead of the 180 made on slower, conventional presses.

### Revolutionary Wean Press continues to amaze the industry

Since it was first introduced to industry, the Wean Flying Press has commanded the interest of imaginative production people.

On paper, it looked good. Tests on the hand made prototype were even more convincing. But, could a production model achieve such levels under actual operating conditions?

For the answer—note the typical production figures set down here. In every case, the Wean Flying Press, using standard die sets, has established a performance record.

Why not acquaint yourself with this amazing press now? Contact the Wean Sales-Engineer in your area or write direct.

# Wean

**EQUIPMENT CORPORATION**

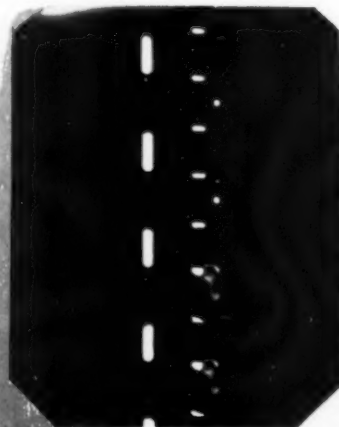
CLEVELAND • CHICAGO • DETROIT • NEWARK, N. J.

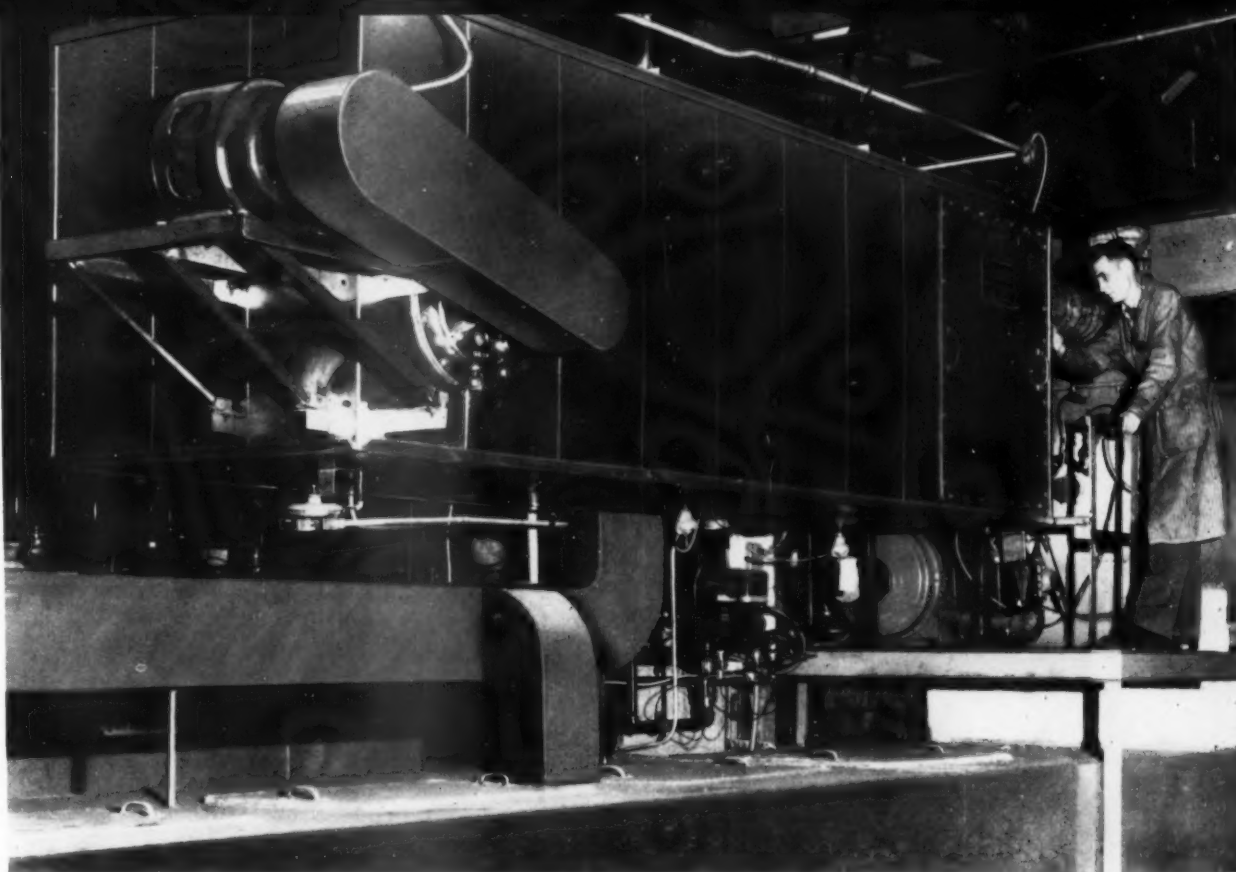
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**Wean**



Shallow draw and punch work on .065 gauge stock boosted to 400 pieces per minute by Wean Flying Press.





## Catalytic combustion for industrial ovens

**fume control—an answer for air pollution control—heat recovery economies, and all performance characteristics are given full analysis by the author.**

*by P. H. Goodell, • CATALYTIC COMBUSTION CORPORATION, DETROIT, MICHIGAN*

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Three primary factors—local and state regulations, fuel economies and safety—have brought increasing interest to bear on destruction of fumes from industrial ovens. Primarily, existing, and anticipated, air pollution control regulations in many areas are forcing a degree of clean-up far beyond that obtainable with any available corrective devices of a few years ago.

Also, with the rising cost of fuels, combustion engineers are showing an increasing awareness of the BTU recovery in vaporized solvent released from organic coatings and binders during the baking process. The relationship between continuous monitoring of com-

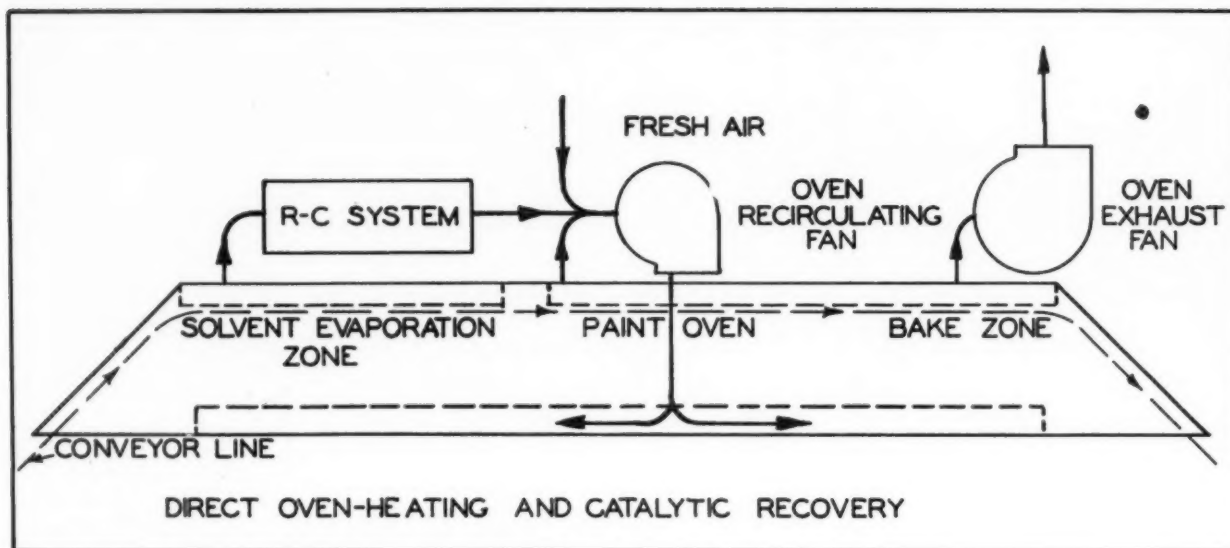
bustible vapor concentration, particularly in the modern high-speed baking oven, and improved safety factors are also gaining wider acceptance throughout industry.

Because of the primary influence of air pollution control regulations, let us emphasize the function of the catalyst in a fume combustion system, the degree of destruction obtainable and the designs employed for reliable and economical operation.

Existing literature already covers various arrangements by which heat recovery can be accomplished on other types of solvent evaporation ovens. Here we will simply chart procedures by which the oven user can analyze, in terms of local fuel cost, the value of the recovered heat and study the direction by which

this heat may be utilized in plant operation.

In the precise mechanism of catalytic oxidation the exposed surface of the catalyst absorbs both oxygen and hydrocarbons from the fume stream, causing them to react on the surface with consequent liberation of heat energy and the normal products of combustion, namely carbon dioxide and water vapor. This reaction will carry forward to completion as long as the proper climate for catalysis is maintained. This essentially requires the preheating of fumes to catalytic ignition temperature which may vary from 500° F. to approximately 625° F. for the usual range of volatiles released. After the catalyst is in operation, this temperature is usually subject to automatic control, with energy



release in the catalyst permitting proportionately lower entering fume temperatures.

#### Operates on self-sustaining basis

With usual ventilation as permitted by Class A oven standards (National Fire Protection Assn.), operation of the system is readily handled on a self-sustaining basis, following cold start-up on the preheat burner. This is achieved in spite of the fact that oven fumes are customarily held at energy levels below 1/4 of the lower limit of flammability. If we assume the oven is being vented at a full 1/4, the temperature rise will be 715° F. It is evident that if the exhaust from an oven is at 300° F., and carries a concentration of 1/4 lower flammable limit, then without added external heat, catalysis will convert these fumes to odor-free and color-free gases at 1015° F.

Catalytic oxidation reactions can be accomplished with a number of totally different types of "active" surfaces. Vanadium, nickel oxide and other metals are employed for high temperature reaction in the chemical industry. However, in most fume disposal applications temperatures are low, and consequently it is necessary to utilize a highly active surface having the minimum practical catalytic ignition temperature. For this reason, metals of the platinum family are normally used.

#### Construction features of catalysts

In our own system the heart is a platinum catalyst element (shown in one

of the accompanying photos) consisting of an 18" x 24" x 2 1/2" element containing approximately 2 miles of chrome nickel ribbon on which the platinum is dispersed and activated to provide flameless combustion, irrespective of the extent to which flames are diluted with ventilation air.

In forming the element, the platinum is deposited on the thin nickel alloy ribbons which are crimped and packed in the form of a mat and conditioned for activity. Similar activated screens serve as entry and discharge faces, and the mat is held in an alloy channel retainer. The finished element has an appearance similar to a metallic air filter.

#### Operational characteristics

An element of this type, with external dimensions of 18" x 24" x 2 1/2" thick, has a nominal through-put capacity of 700 CFM at 70° F., or the corresponding volume of fumes at any higher temperature. One or more elements as may be necessary for consuming the total volume of fumes can be racked up side by side on an asbestos gasketed structural frame and securely held in place by stud bolts. This light weight, non-fragile construction provides rapid thermal response, high surface area for efficient combustion, excellent life at operating temperatures up to 1600° F., and high corrosion resistance. Elements are easily removed from the frame support for inspection and occasional washing when needed.

With all parts of metal having similar expansion characteristics, there is no flaking or spalling of the vital catalyst surface. Operating statistics show that large numbers of the elements have demonstrated service life in ovens beyond 15,000 operating hours, with a considerable number in older fields of application now exceeding 25,000 hours without need for factory service. A simple factory reactivation process may be given to the elements to provide them with a second or third life span.

#### Use of fume combustion system

Essentially, the fume combustion system consists of an insulated housing with inlet and outlet duct connections.

#### The Author



P. H. Goodell





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Enameling Supplies

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Asbestos Mitts	Spray Equipment: Safety Block and Tackle, Containers, Transformers, Compressors, Fans, Tanks,
Asbestos Slip-on Patches	Turntables, Parts, Hose, Fittings, Reflectors, etc.
Stencil Brush	Muffles, Muffle Brick and Tile
Adjustable Edging Brush	Radiant "W" Tube Muffle Centre Wall
Flat Cleaner Brush	Rubbing Stones, White Alundum, 60 Mesh, 80 Mesh and 150 Mesh
Bolt Hole Brush	Frits, Porcelain Enamel, Acid-Resisting and Non-Acid- Resisting: Ground Coats, Cover Coats, Black Edging
Beading Sponges	Furnaces—Batch, Continuous, Laboratory—All Fuels
"Ferro-Processed" Clays	Complete Line of Laboratory Equipment
Electrophotometer Unit	Boric Acid • Ammonium Carbonate • Zinc Oxide • Borax • Bentonite, Purified • Gum Tragacanth •
Color Oxides by Ferro	Sodium Nitrite • Magnesium Carbonate • Potassium Carbonate • Nephelite-Syenite • Single Nickel Salts
Magnetic Separators	Compressed-air-operated Ejectopump
Plain Loop Racks	Porcelain Lining Blocks and Balls
Hanging Racks	Pickling Equipment
Point Loop Racks	Mills
Straight Point Bars	
1" Triangle Bars	
Burning Bars	

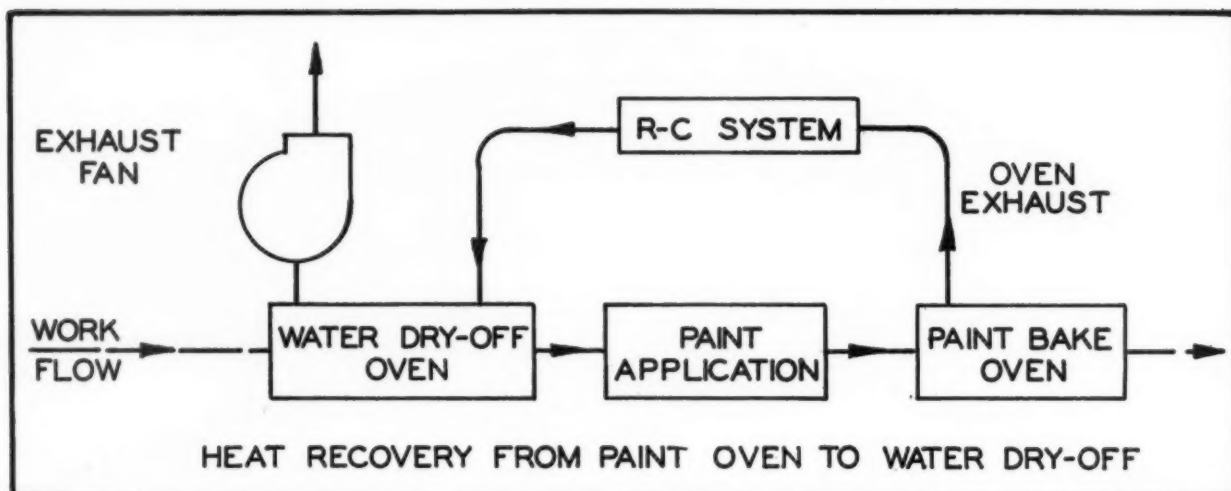
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It contains a preheat burner with the necessary ignition, control and limit protective circuits, an exhauster which replaces the conventional oven exhauster and the catalyst elements.

Entering fumes are preheated to the required catalytic ignition temperature, and flameless combustion occurs in the catalyst bed. Moreover, by recycling a portion of the hot oxidized gases from the discharge side of the catalyst into the entering fume stream, a major portion, if not all of the heat required for maintaining catalytic ignition temperature, is furnished. A sketch showing this recycling or R-C type system, appears with this report. Flow diagrams also show how heat may be returned directly to the oven, or to an adjacent water dry-off oven by using catalytic combustion.

The entire assembly is mounted directly on the oven roof, and controls are handled normally on a panel supplied with the unit. These include a safety disconnect switch, motor starter, control transformer, conventional flame failure protection equipment and the necessary relays for interlocking the oven heating circuit.

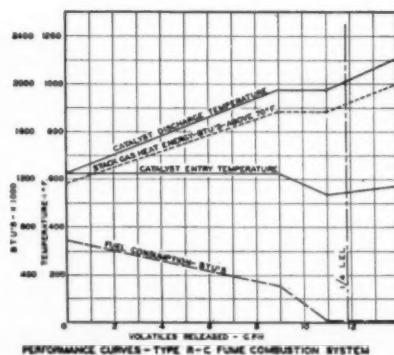
#### Typical performance data

To give a picture of catalytic fume combustion, let us follow through the operation of a typical oven which handles some 70 sheets of tin plate per minute with white vinyl coatings and solvent loads in the range of 6 to 10 GPH. The accompanying graph shows the collected data on the oven, also heating and temperature curve calculations using the measured 1810 SCFM

exhaust volume, and an oven exhaust temperature of 275° F. As the chart notes, gas consumption was reduced to less than 200,000 BTU per hour at the 6-GPH solvent load. It was eliminated entirely above 11 GPH. The curve showing total energy in the stack gases was produced by summation of sensible heat in the oven exhaust gases, full consumption in the unit, and the latent energy of fumes based on an assumed heat of combustion of 120,000 BTU/gal.

#### Best fume destruction conditions

With increased solvent concentration, the outlet temperature from the unit increases. The best economy in providing for fume destruction — and the greatest opportunity for heat recovery — exists whenever an oven is being operated at solvent loads approaching design conditions, usually established at a ventilation volume at or near 1/4 of the lower limit of flammability. Moreover, when solvent loads are consistently low, the vent volume can often be reduced to assure efficient oven operation and somewhat higher fume concentrations.



At a solvent load of 9 GPH, the temperature rise from combustion in the catalyst bed is shown to be 360° F. By relating this to the total volume passing through the catalyst bed (1810 SCFM oven exhaust, plus 990 SCFM recycle), the total heat release is shown to be 1,092,000 BTU per hour. The heat of combustion of the solvents is thus shown to be approximately 121,000 BTU per gallon.

The energy available for recovery in the oven will be:

$$1810 \times 60 \times \frac{980 - 275}{55} = 1,390,000 \text{ Btu/hr.}$$

This is based on oven operation at 275° F., and a catalyst discharge temperature of 980° F. A 55° F. rise is assumed for each Btu released per standard cubic foot, this being the usual thermal capacity of dry air.

If the oxidized gases are returned to the adjacent water dry-off oven, as shown in one of the accompanying flow diagrams, the energy available is:—

$$1810 \times 60 \times \frac{980 - 70}{55} = 1,791,900 \text{ Btu/hr.}$$

The increase in available energy is explained by the difference between oven exhaust and supply air temperature for the dry-off oven. This re-use of energy from one oven to another also reduces building make-up air requirements by 1810 scfm, with a corresponding reduction in winter heating load.

#### Extent of heat recovery

With the across-the-industry variance in fuel costs, no all-conclusive statement can be made on the amount of savings that result from employment of heat recovery systems. The greatest oppor-

tunity for profitable recovery, however, occurs in those ovens which operate consistently at solvent loads approaching maximum intended design. The energy available will normally be equivalent to the latent energy in the solvents (usually calculated at the average figure of 120,000 Btu/gal.), plus the sensible heat present in the exhaust gases above the intended re-use temperature.

In the case of metal decorating ovens, heat recovery from the exhaust gases is most appropriately used to preheat the returning wickets immediately ahead of the automatic loader. In many other types of ovens, the oxidized gases are used to preheat building make-up air by the use of an air-to-air heat exchanger.

The greatest opportunity for efficient heat recovery at minimum investment cost exists when the catalyst system is incorporated as an integral part of the original oven design. This avoids duplication of investment for fans, burners, controls, fume collection ducts, and other auxiliary equipment. Space requirements are reduced, and the oven designer is assured maximum latitude for integrating efficient heat utilization, desired baking results, and fume and condensate disposal.

#### Fume disposal methods

As indicated earlier, catalytic oxidation also provides a low cost, single-step method for elimination of fumes and flammable condensate. Its use is being rapidly extended where community relations or air pollution regulations require the disposal of by-product exhaust vapors. During the oven operation previously described, a continuous sample of the catalyst discharge gases was taken for a one hour period. During this test, the catalyst entry temperature was held at 625 deg. F. This was dictated by fume constituents and the available energy in the exhaust gases.

Subsequent laboratory analysis showed the following constituents remaining in the oxidized gases:

Contaminants	Grains/SCF	Total Calculated lbs./hr.
Particulate matter	0.0039	0.066
Soluble solids	0.0087	0.146
Chloroform —		
Soluble solids	0.0012	0.020
Total atmospheric contaminants contained in 1960 SCFM.....		0.232 lbs./hr.

During the sampling period, combustibles entering the oven were found to be 8.43 gallons, representing a total weight of 63.2 lbs. From the weight of unconsumed material (0.232 lbs.), the combustion efficiency is then calculated as:

$$\frac{(63.2 - 0.232) 100}{63.2} = 99.3\%$$

As observed, the gases were reported to be free of color, objectionable odors and eye irritants. Moreover, there was no accumulation of condensate within the catalyst housing or stack during the test.

#### Additional safety factors

In addition to reducing fire hazard by elimination of condensate in concealed areas, additional protection may also be provided for solvent evaporation ovens, by the use of a high limit controller with thermal element on the discharge side of the catalyst. This controller may be preset to ring an alarm, interrupt the flow of materials to the oven, or energize an emergency ventilation fan when a preset temperature is reached, corresponding to the upper limit of flammability or fume concentration considered safe for the process.

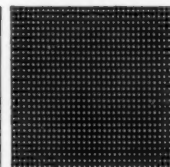
Such provisions for improving or monitoring safe levels of oven operation may be readily applied to ovens by sampling a portion of the exhaust gases if complete processing of the fume stream will serve no further purpose.

#### Wide use of system

It is evident that catalysis may be usefully employed on ovens to serve one or a combination of objectives. Appraisal on a dollar and cents basis requires individual knowledge of operating temperatures, solvent loads, fuel costs and hours of operation. Systems as described are now extensively used on wire enameling ovens, metal lithographing ovens, foundry core ovens, lamination ovens, continuous impregnation and painting ovens. Exhaust vapors from virtually all of the conventional varnishes, protective and decorative coatings are being handled regularly by one or more of the several hundred catalyst systems now in service. New and improved uses are continuously under development by the appliance, electrical, automotive and chemical industries.

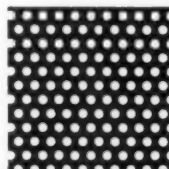
## Perforated Materials for Every Application

Contact H & K for  
any perforated  
materials your  
product may  
require.



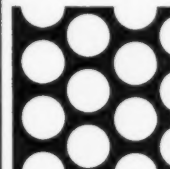
No. 00 Straight Holes  
952 holes per sq. in.  
.020" diam. 30% open.

We have tools  
for perforating  
thousands of  
different patterns.



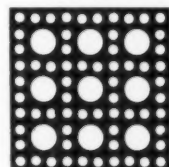
.000" Staggered Holes.  
128 holes per sq. in.  
3/32" centers. 36% open.

We will be glad  
to work with you  
on your perforat-  
ing problems.



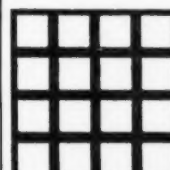
1/4" Staggered Holes.  
5/16" centers.  
.25" diam. 58% open.

See our catalog  
in Sweet's Product  
Design File.



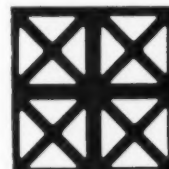
Lincane 47% open

Perforating all  
metals, Masonite,  
plywood, paper,  
cloth and plastic.



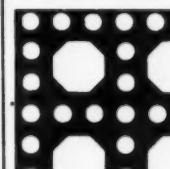
Two-tenths square,  
84% open.

Round holes,  
square holes,  
slots, ornamental  
patterns, oblong  
holes, oval holes.



Perflex 40% open

Fill-in and  
mail coupon  
to office and  
warehouse  
nearest you.



Cane "41" 41% open.

**THE Harrington & King PERFORATING CO.**

Chicago Office and Warehouse  
5640 Fillmore Street  
Chicago 44, Ill.

New York Office and Warehouse  
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New York, N. Y.

Please send me—

☐ GENERAL CATALOG NO. 62

☐ STOCK LIST of Perforated Steel Sheets

☐ SAMPLES of Perforated Plastics and Paper

☐ PRICE INFORMATION (NOTE: Send specifications of perforated materials wanted. If necessary send drawings or sketches.)

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

STREET \_\_\_\_\_

CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_



## Market and statistical review of the appliance and metal products manufacturing field

CONTINUING as one of the fastest growing fields in our entire economy, the volume producing appliance and fabricated metal products industry seems set this year to shatter the production and sales records it set in 1955. Industry forecasters project increases up to 20% for the different segments in 1956. Some of the projections — in brief — are at the lower left. The whole picture, however, is on the facing page. The following pages show results of the *finish* survey just completed which brings the 1955 and previous marketing and production picture into sharp focus.

### *finish* REPORTS the 1956 FORECAST

Notwithstanding the record 1955 production year for appliances and other metal fabricated products, the best statistical and business brains in the industry forecast an even better year in 1956. Here are some of the percentage increases, as they see it.

Air Conditioners	UP 15 %
Electric Appliances	UP 6 %
Gas Appliances	UP 2.5%
Home Laundry Equipment	UP 2 %
Steel Containers	UP 6.6%
Steel Kitchen Cabinets	UP 20 %

That means 1956 unit production will be

Air Conditioners	1,460,500
Electric Appliances	73,143,180
Gas Appliances	10,178,806
Home Laundry Equipment	5,816,916
Steel Containers	115,591,710
Steel Kitchen Cabinets	4,855,200

### SUMMARY

(Typical segments only — data available)

Product	1953
Air Conditioners, room .....	44,691
Electrical Appliances .....	67,300
Cooking & Heating Equipment (non electric) .....	75,369
Home Laundry Equipment (domestic only) .....	11,366
Plumbing Ware .....	61,193
Steel Containers .....	7,000
Steel Kitchen Cabinets .....	41,000
Vacuum Cleaners .....	77,756
TOTAL UNITS .....	85,675





## ESTIMATED UNIT SHIPMENTS GAS APPLIANCES 1956

	% Increase	Unit Increase	Total Units Estimated 1956
Domestic Gas Ranges (excluding built-ins)	+ 0.5%	11,084	2,228,027
Automatic Gas Water Heaters	+ 0.4%	10,387	2,607,123
Warm Air Furnaces	+ 5.7%	9,429	1,356,380
Boilers	+ 18.7%	17,000	108,000
Conversion Burners	+ 4.1%	210,000	218,600
Vented Recessed Wall Heaters	+ 1.3%	5,000	382,000
Gas Floor Furnaces	- 9.3%	15,000	146,000
Gas Direct Heating Equipment	+ 5.1%	75,000	1,545,000
Gas Unit Heaters	+ 28.5%	26,556	119,730
Gas Incinerators	+ 39.7%	NA	NA
Gas Hotel and Rest. Equipment	+ 12.9%	NA	NA

Source: GAMA

## ESTIMATED UNIT SHIPMENTS ELECTRIC APPLIANCES 1956

	% Increase	Unit Increase	Total Units Estimated 1956
Food Waste Disposers	+ 30.0%	156,000	676,000
Dishwashers	+ 30.0%	88,500	383,500
Dehumidifiers	+ 15.0%	13,800	105,800
Fans	+ 10.0%	555,500	6,110,500
Water Heaters	+ 10.0%	90,000	990,000
Freezers	+ 5.0%	55,000	1,155,000
Refrigerators	+ 5.0%	201,250	4,226,250
Electric Housewares	+ 5.0%	989,500	20,779,500
Electric Ranges	No Change	No Change	1,600,000

Source: NEMA



## HOME LAUNDRY EQUIPMENT

1955

Product	Units	Value
Domestic		
Washing Machines	4,236,555	\$ 997,678,503
Ironing Machines	81,910	17,283,010
Dryers	1,384,394	305,082,774
Sub Total	5,702,859	1,320,044,287
Export totals unavailable		

1954

Product	Units	Value
Domestic		
Washing Machines	3,490,212	\$ 807,781,875
Ironing Machines	86,205	17,844,435
Dryers	897,751	209,290,171
Sub Total	4,474,168	1,034,916,481
Export		
Washing Machines	91,156	20,199,058
Ironing Machines	3,635	451,758
Dryers	15,928	3,708,544
Sub Total	110,719	24,359,360
Grand Total	4,584,887	\$1,059,275,841

Source: American Home Laundry Manufacturers' Assn.  
Retail value estimated by finish

## SHIPMENTS

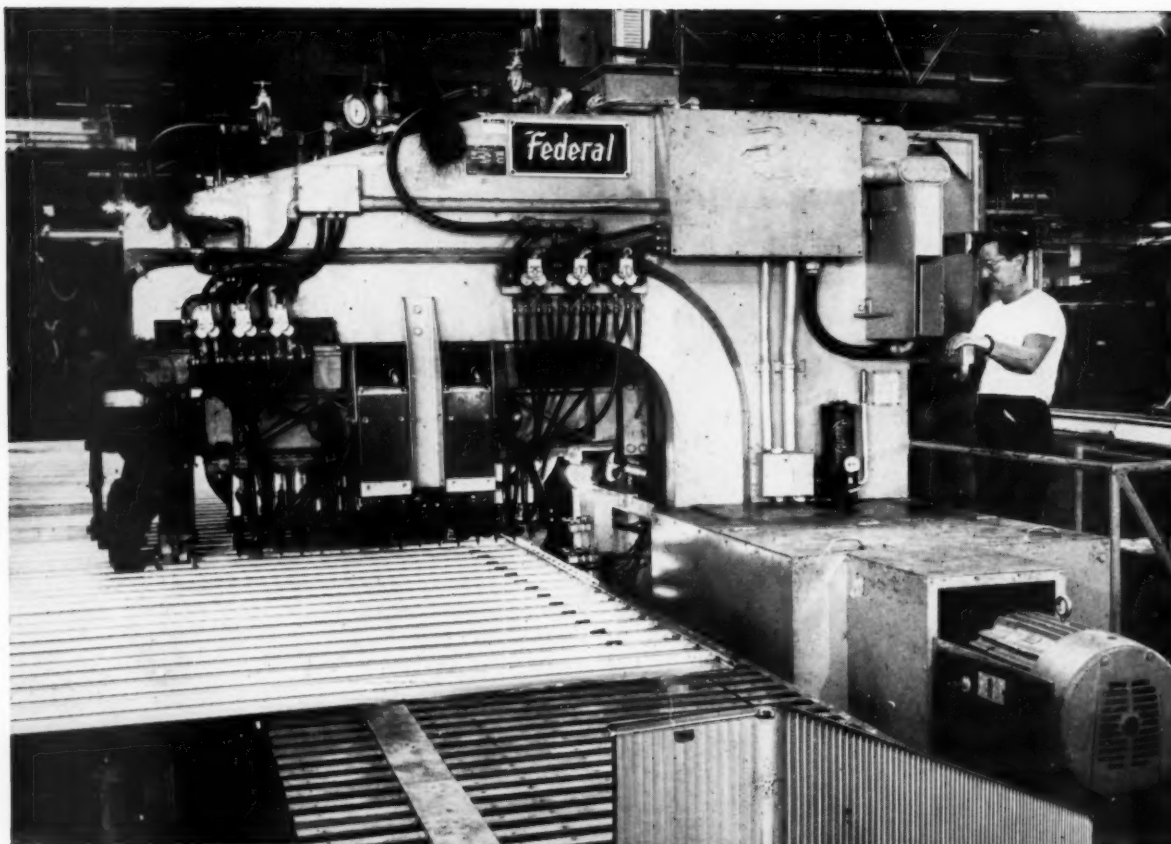
(data available for many groups)

	Units Shipped		
	1953	1954	1955
...	44,691	1,230,000	1,270,000
...	67,300	62,234,000	69,003,000
...	75,369	8,967,606	9,930,542
...	11,366	4,474,168	5,702,859
...	61,193	5,841,017	6,594,644
...	07,000	96,850,000	108,435,000
...	41,000	3,372,000	4,046,000
...	77,756	2,658,136	3,270,441
...	85,675	185,626,927	208,252,486

CONTINUED



## How ~~Federal~~ Helps Budd...

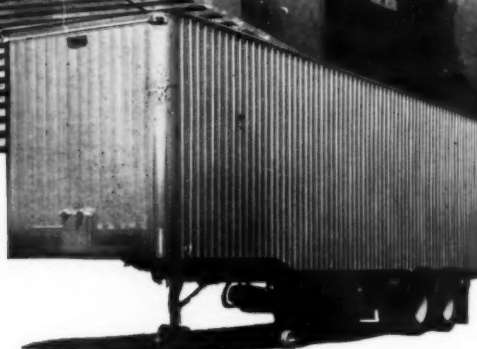


### BUILD BETTER SUB-ASSEMBLIES FOR STAINLESS STEEL TRUCK TRAILERS

Welding trailer side panel sections of stainless steel for the popular new Fruehauf Volume Van required special welding machines. The Budd Company, one of the nation's largest manufacturers of transportation equipment, naturally, turned first to Federal.

Federal, in cooperation with Budd, designed and built an ingenious "C" frame multi-spot traveling welder that turned the difficult job of welding side frame panels and structural skirt sections into a high production operation.

Self-propelled on 120 feet of rail, the machine travels over the work which is laid horizontally on a copper shunt die back-up fixture. It features an adjustable slow speed for indexing with a rapid traverse for return. Two rows of tandem piston, double-acting air guns are indexed at right



*Stainless steel sub-assemblies for the Fruehauf Volume Van (above) are fabricated by the Budd Company for Fruehauf.*

angles to the line of welder travel to permit close spot welding. The machine automatically positions itself and selects gun sequence. Operator, riding with the machine, always has clear view of work, ready access to controls.

If your operation calls for special resistance welding — you, like leading manufacturers, should call on Federal — First in Resistance Welding.

**Federal**  
WELDERS

**Warco**  
PRESSES

9801

**WELDING  
SHOW**

Booth No. 73

**THE FEDERAL MACHINE AND WELDER COMPANY**

**WARREN, OHIO**

## COOKING AND HEATING EQUIPMENT—NON ELECTRIC

Product	1953		1954		1955	
	Units Shipped	Value	Units Shipped	Value	Units Shipped	Value
Cooking Stoves and Ranges.....	2,385,983	\$205,819,000	2,207,489	\$182,743,700	2,440,338	\$213,093,000
Gas .....	2,097,462		1,967,113		2,216,943	
Bungalow Ranges....	53,223		37,539		28,653	
Coal & Wood .....	83,062		67,897		70,317	
Combination Ranges..	34,630		25,667		13,966	
Kerosene, Gasoline & Fuel Oil .....	117,606		109,273		110,468	
Domestic Heating Stoves .....	3,278,473	84,649,000	2,278,661	61,002,400	2,415,013	69,097,000
Floor and Wall Furnaces.....	551,614	36,198,000	539,894	31,063,100	558,455	36,565,000
Water Heaters .....	2,183,000	114,607,500	2,281,100	119,757,800	2,596,636	140,956,000
Oil Burners .....	579,696	58,320,000	528,580	56,062,300	573,149	54,924,000
Residential .....	540,774		494,259		536,234	
Commercial & Industrial .....	38,922		34,321		36,915	
Warm Air Furnaces.....	996,603	197,275,000	1,131,882	205,895,200	1,346,951	255,592,000
Total .....	9,975,369	\$696,868,500	8,967,606	\$656,524,500	9,930,542	\$770,227,000

Source: Gas Appliance Manufacturers' Assn. and Facts for Industry.

## ROOM AIR CONDITIONERS

(Units Shipped)

	1954	1955
Window-Sill Type ...	1,218,000	1,257,300
Floor Type .....	12,000	12,700
Total .....	1,230,000	1,270,000
Estimated Retail Value	\$419,298,000	\$412,800,000

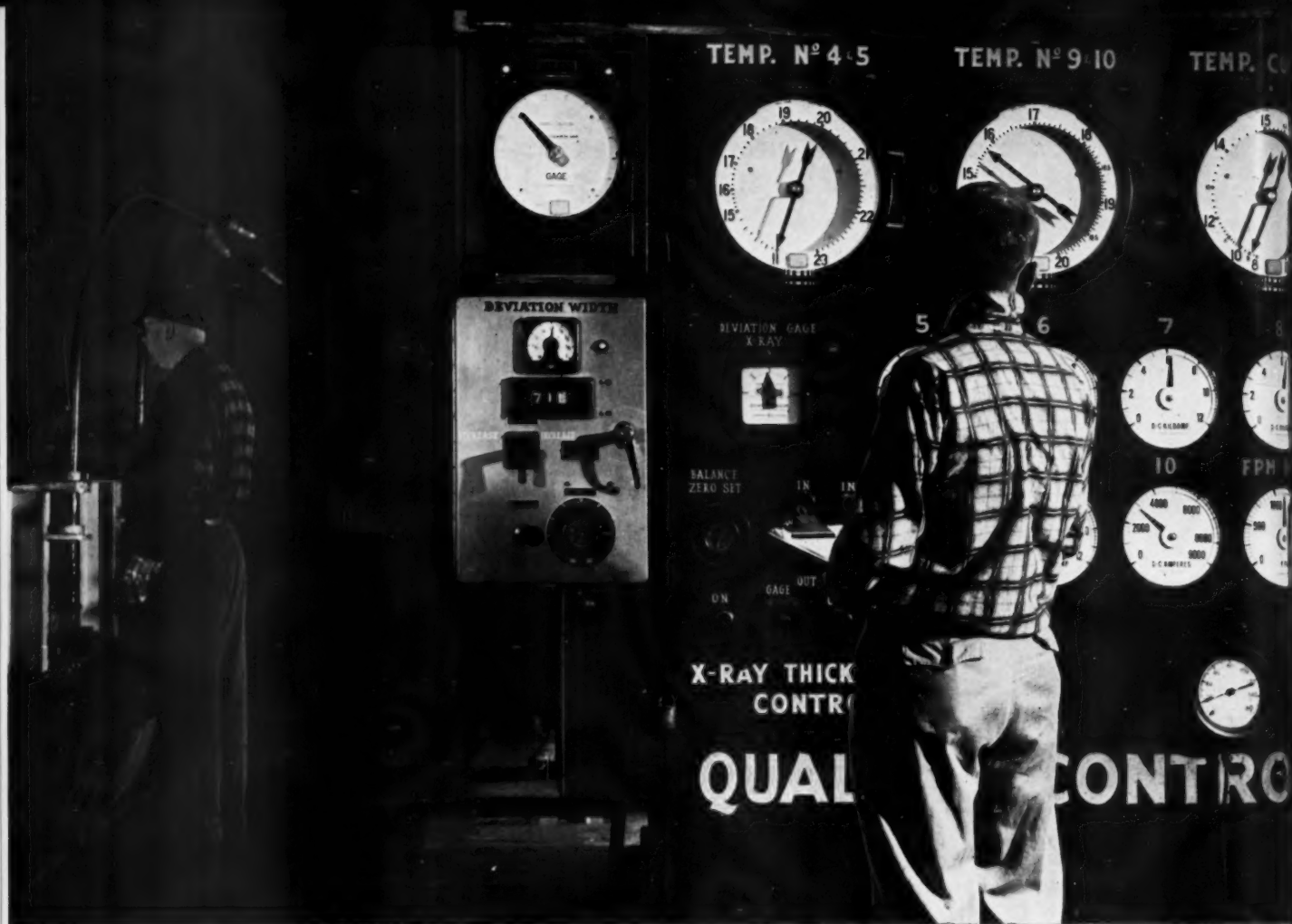
Source: Air-Conditioning and Refrigeration Institute  
Retail value estimated by finish

## PLUMBING FIXTURES (Units Shipped)

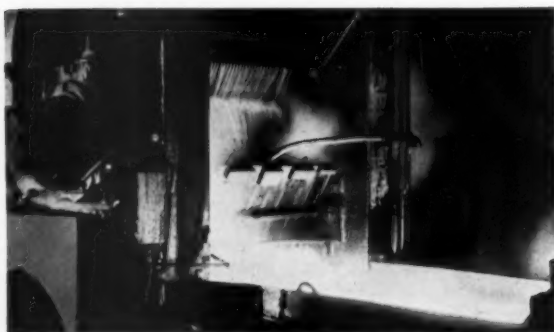
Product	1955		1954		1953	
	Units Shipped	Value	Units Shipped	Value	Units Shipped	Value
Lavatories						
Cast Iron .....	1,540,111		1,342,389		1,337,865	
Steel .....	303,955		248,301		213,293	
Total .....	1,844,066		1,590,690		1,551,158	
Kitchen Sinks						
Cast Iron .....	1,060,086		1,008,873		1,022,101	
Steel .....	1,363,971		1,169,121		1,096,584	
Total .....	2,424,057		2,177,994		2,118,955	
Bathtubs						
Cast Iron .....	1,678,467		1,507,786		1,434,881	
Steel .....	648,054		564,547		456,199	
Total .....	2,326,521		2,072,333		1,891,080	
Product						
Lavatories						
Cast Iron .....	1,217,333		1,630,554		1,813,000	
Steel .....	219,374		232,699		276,000	
Total .....	1,436,707		1,863,253		2,089,000	
Kitchen Sinks						
Cast Iron .....	1,000,835		1,212,586		1,415,000	
Steel .....	1,015,328		1,196,859		1,478,000	
Total .....	2,016,163		2,409,445		2,893,000	
Bathtubs						
Cast Iron .....	1,355,181		1,504,471		1,815,000	
Steel .....	454,500		413,477		493,000	
Total .....	1,809,681		1,917,948		2,308,000	

Source: Facts for Industry.





## How Great Lakes Steel *guides* quality



**FIRST QUALITY CHECK** is made at No. 1 Mill Stand. Here, an electronic pyrometer relays the strip's temperature to the panel.



**FINAL CHECK** in this operation is made at the coiler. From slab to coil, the control panel spells far better quality.

Here's one of several electronic operation panels that take the guesswork out of quality control at Great Lakes. You'll find this one guiding the entire operation of the 96-inch continuous mill.

As the red-hot strip races from roll stand to roll stand and on to the coiler, the temperature, speed, width and thickness of the strip *at each stage* are instantly shown on the panel.

A glance at the panel tells the operator if any adjustments are necessary to assure a finished product of the highest quality—a product that will stand the rigid test of your specifications.

This is further proof that Great Lakes has what it takes—the experience and the very latest equipment—to make your product even better. Our representative is just one telephone call away.

### **GREAT LAKES STEEL CORPORATION**

Ecorse, Detroit 29, Michigan • A Unit of



*District Sales Offices:* Boston, Chicago, Cincinnati, Cleveland, Grand Rapids, Houston, Indianapolis, Lansing, Los Angeles, New York City, Philadelphia, Pittsburgh, Rochester, St. Louis, San Francisco, Toledo, Toronto.



FOR ELECTRIC HEATING "BUILT" FOR THE JOB

BETTER SEE

**"TK"**



Heating is the "heart" of many major electric appliances. Heating elements are of primary importance...and must be engineered to give continuous, service-free, long-life performance.

The challenge (to both you and us) is to develop the *right* heater for each specific specification.

Here at TK you find the *Know-how* . . . so put TK's facilities to work for YOU!



**TUTTLE & KIFT, INC.**

ELECTRIC HEATING ELEMENTS • DEVICES • SWITCHES & CONTROLS  
1823 N. MONITOR AVENUE • CHICAGO 39, ILLINOIS



## ELECTRICAL APPLIANCE SALES

Product	1954		1955	
	Units	Retail Value	Units	Retail Value
Coffee Makers .....	3,450,000	\$ 68,674,500	3,675,000	\$ 71,662,500
Dehumidifiers .....	76,000	10,260,000	92,000	11,914,000
Dishwashers .....	215,000	64,500,000	295,000	90,270,000
Fans .....	6,735,000	251,116,500	5,555,000	203,598,000
Food Waste Disposers ....	400,000	47,980,000	520,000	62,374,000
Freezers .....	990,000	391,425,000	1,100,000	439,945,000
Heaters .....	1,330,000	34,232,500	1,535,000	45,146,000
Hotplates .....	710,000	5,928,500	720,000	5,580,000
Irons .....	6,583,300	95,062,300	8,028,000	114,798,800
Radios .....	6,276,000	188,787,400	7,800,000	248,530,000
Ranges .....	1,350,000	353,700,000	1,600,000	420,800,000
Refrigerators .....	3,600,000	1,095,865,000	4,025,000	1,267,875,000
Roasters .....	350,000	13,982,500	330,000	13,183,500
Television .....	7,346,700	1,689,741,000	7,905,000	1,833,960,000
Toasters .....	3,110,000	52,226,600	3,350,000	56,318,000
Waffle Irons .....	928,000	17,354,000	995,000	18,905,000
Water Heaters .....	800,000	101,337,500	900,000	107,955,000
Water Systems .....	728,000	123,400,000	788,000	130,000,000
Other Small Appliances* ..	17,256,000	383,771,700	19,790,000	425,966,700
Total .....	62,234,000	\$4,989,345,000	69,003,000	\$5,568,781,500

\*Including Blenders, Deep Fat Fryers, Floor Polishers, Food Mixers, Shavers, Broilers, Clocks.  
Source: Electrical Merchandising.



## STEEL KITCHEN CABINETS

1955  
Units Sold .... 4,046,000  
Retail Value .. \$209,328,000

1954  
Units Sold ..... 3,372,000  
Retail Value ... \$174,440,000

1953  
Units Sold ..... 3,441,000  
Retail Value ... \$178,000,000

Source: Steel Kitchen Cabinet  
Manufacturers' Association.

## VACUUM CLEANERS

Product	1953		1954		1955	
	Units	Estimated Retail Value	Units	Estimated Retail Value	Units	Estimated Retail Value
Vacuum Cleaners ....	2,777,756	\$262,277,000	2,658,136	\$251,858,400	3,270,441	\$307,421,454

Source: Vacuum Cleaner Manufacturers' Assn. (Retail value estimated by finish)

## STEEL CONTAINER ANNUAL SHIPMENTS

	1949	1950	1951	1952	1953	1954	1955
19 Gauge & Heavier 13 Gallons & Larger...	23,110,000	26,241,000	29,763,000	24,028,000	23,558,000	22,051,000	24,822,000
Lighter than 20 Gauges 12 Gallons & Larger...	6,080,000	7,817,000	8,290,000	7,603,000	7,741,000	7,737,000	8,712,000
Heavier than 29 Gauge 12 Gallons & Smaller...	52,765,000	66,129,000	73,681,000	61,286,000	67,008,000	67,062,000	74,901,000
Total .....	81,955,000	100,187,000	111,734,000	92,917,000	98,307,000	96,850,000	108,435,000

The steel container industry ranks second only to the automotive industry in the Nation's consumption of sheet steel.

Source: Steel Shipping Container Institute, Inc.



# NOW

*for the  
first time...*

## PORCELAIN ENAMEL

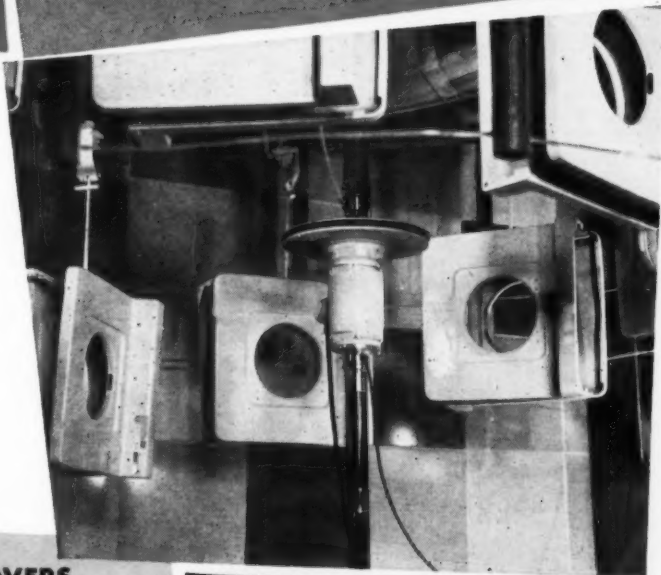
is being applied successfully—

Yes, even spectacularly—

with **RANSBURG NO. 2  
ELECTROSTATIC SPRAY  
PROCESS**

General Electric—an extensive user of Ransburg Electro-Spray for painting with synthetic enamels—is the first to use Ransburg No. 2 Process in the application of porcelain enamel.

GE—less than a year in electrostatic production—now is processing almost a million square feet of cover coat each month in the General Electric Home Laundry finishing department at Appliance Park.



### **DRYER TOPS AND WASHER COVERS ARE BEING COATED ELECTROSTATICALLY WITH THESE SPECTACULAR RESULTS**

Quality of appearance and chip resistance are greatly improved with all colors: white, yellow, pink, turquoise, blue and brown.

About 97% of the atomized enamel is deposited on the washer and dryer parts.

Because of improved uniformity in coating thickness, weight of applied enamel was substantially reduced.

Because of lower application weight, the few rejected parts can be re-processed more times before being scrapped. This reduces the ultimate scrap rate by at least 95% of that previously expected.

Efficiency, measured by the amount of good ware, averages above 90%.

### *Want your products tested?*

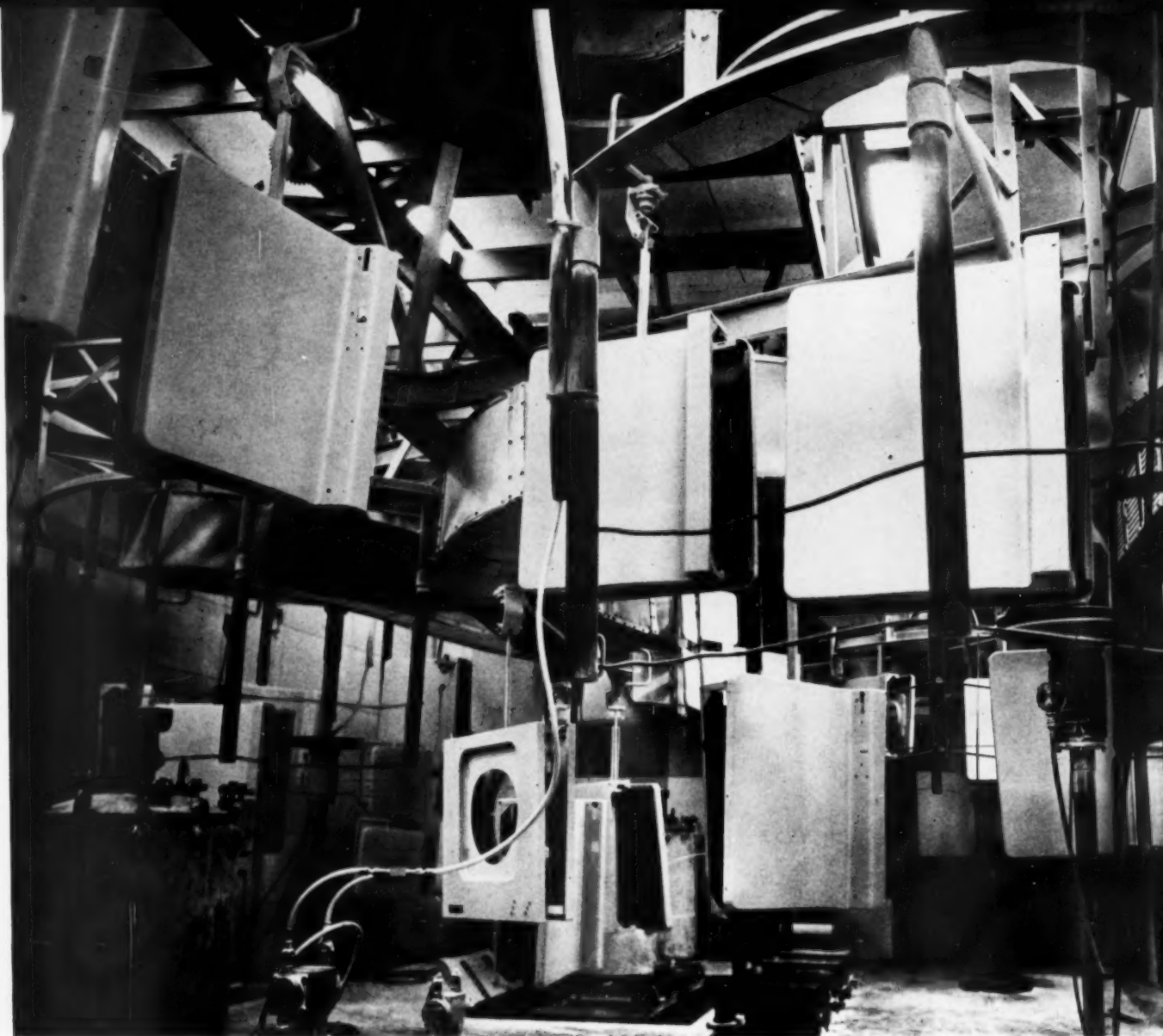
Ransburg has fully equipped laboratory facilities including reciprocating disks, helical conveyors, stationary disks, and the latest advancements in equipment for applying porcelain enamel with the No. 2 Electrostatic Spray Process. Manufacturers are invited to send sample products to our Indianapolis laboratories for tests and demonstrations to prove for you the advantages and benefits of electrostatic spray application of porcelain enamels.

*Ransburg*

**ELECTRO-COATING CORP.**

Indianapolis 7, Indiana

**RANSBURG**



## Electrostatic spraying porcelain enamel at General Electric

after only one year in production G.E. is processing almost a million square feet of cover coat each month at its Appliance Park home laundry department

by *W. L. Smart* • PROJECT ENGINEER, RANSBURG ELECTRO-COATING CORPORATION

WHEN plans were being made for the production of home laundry equipment at Appliance Park — General Electric's Louisville, Ky., operation — early consideration was given to the employment of the electrostatic spraying process for finishing components that were to be finished in porcelain enamel.

Having used the process with excel-

lent success for the application of synthetic enamel, T. J. Snodgrass, Supt. of Finishes for the home laundry department, was confident that, with close co-operation between the suppliers of equipment, the frit producers, and G-E personnel, it could also be used successfully for the application of porcelain enamel.

A project group was formed and

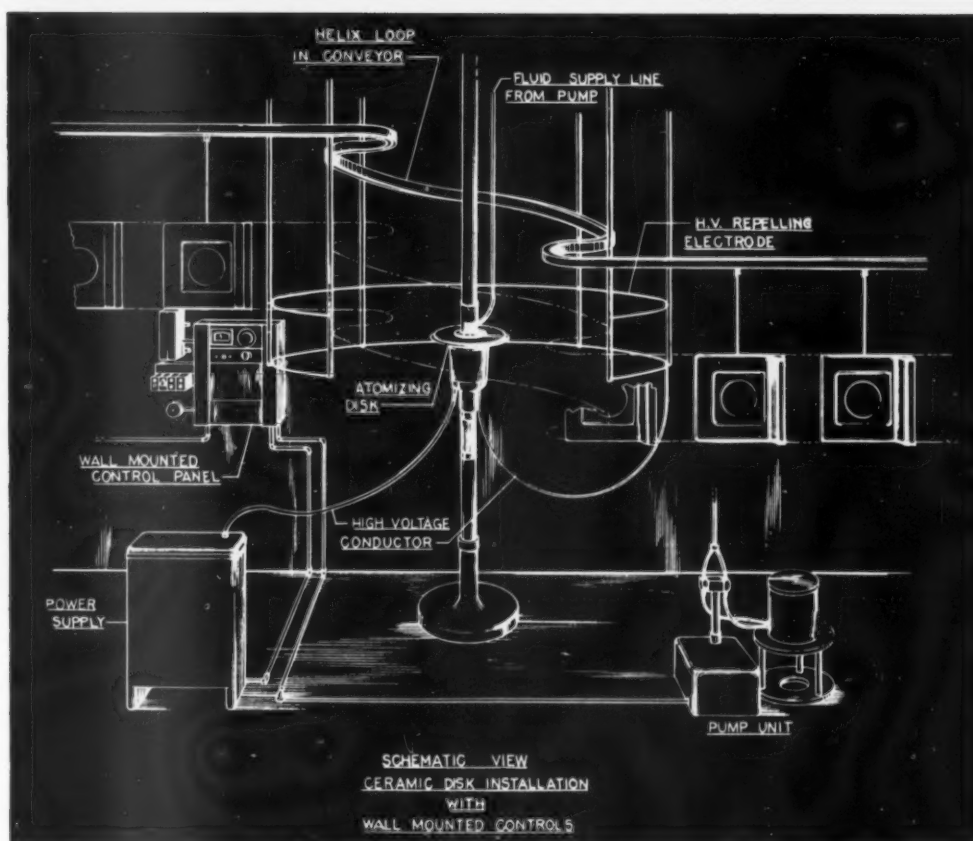
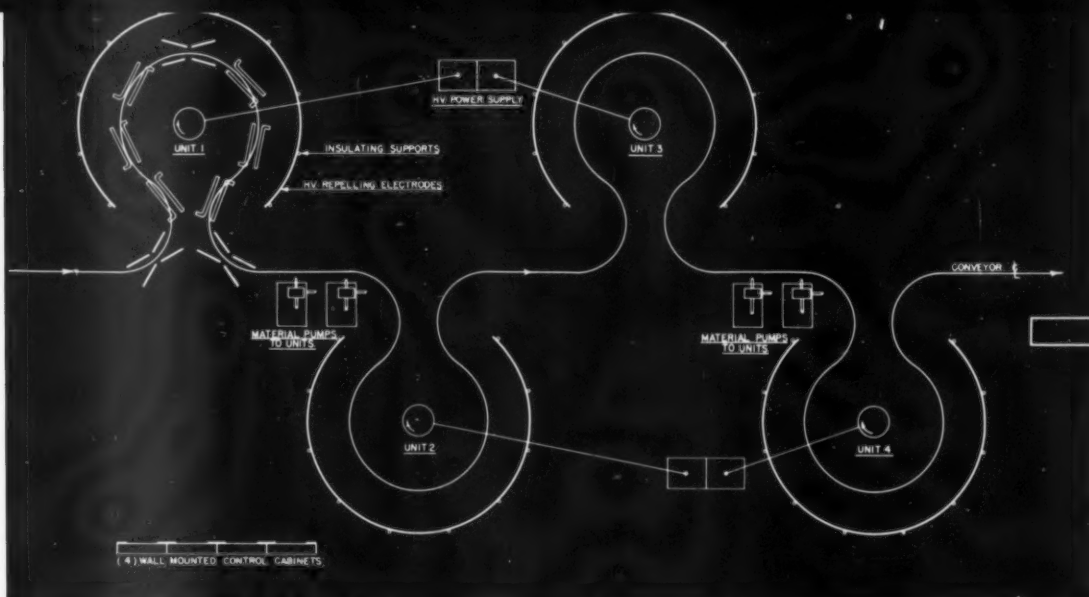
everyone "pitched in" to complete the necessary test work in the shortest possible time. As the porcelain enameler will know, a great deal of work was required of the frit manufacturer in connection with slip characteristics, fineness of grind, etc.

The installation was made in February, 1955, after completion of the development program. By March G.E.





## General Electric



was in very substantial production and was able to gradually increase its output as personnel became more familiar with enamel shop practices. After a year in production G.E. now processes almost a million square feet of cover coat each month.

The process as it is used to apply porcelain enamel in G-E's home laundry department employs a conveyor having a helical (or spiral) path, carrying the ware around a stationary (i.e., not re-

ciprocating) disk atomizer. (*Ed. note: see earlier descriptions in finish regarding application of organic finishes*)

The voltage pack supplies 90,000 volts dc to the disk through a heavily insulated cable. This same cable supplies three-phase power which operates the disk rotating motor.

### System for disposal of slip

The slip is supplied from above and to the center of the 20-inch disk by spe-

cially designed diaphragm pumps from electrically isolated storage tanks. Centrifugal force carries the slip to the disk edge where it is atomized under the influence of the electrostatic field and deposited on the electrically grounded ware. A stationary plastic disk prohibits excessive air movement from the edge of the rotating disk.

The repelling electrodes surround the loop outside of the ware and are also charged to 90,000 volts dc. The electro-

# ING-RICH Research and Development

in collaboration with Ransburg Electro-Coating Corp.  
pioneers another great advance  
in porcelain enameling . . . . .

## PORCELAIN Enamel Coating by ELECTROSTATIC SPRAY

This radically different method of coating, now applicable for the first time in ceramic finishing, brings tremendous possibilities for economy, better finishes and uniformity of product.

Coating is applied automatically, and *all* is deposited on the piece to be enameled. No excess spray to be exhausted, no waste to clean up.

Much higher uniformity of both coverage and finish is achieved than is possible with any other system. Coverage is controlled automatically. Duplication of spray pattern is automatic. Reworks and rejects are practically eliminated.

The process has been thoroughly proved in months of daily production in one of the largest home appliance plants in America, where it is permanently installed. Results have met every requirement.

Ing-Rich FRITS with inherent characteristics for electrostatic coating and the same know-how that made possible this greatly improved method are now available to you.

We will be happy to furnish full information and a frank appraisal of the advantages and limitations of electrostatic coating for your purposes. Write today or phone Frankfort, Indiana, 5525.

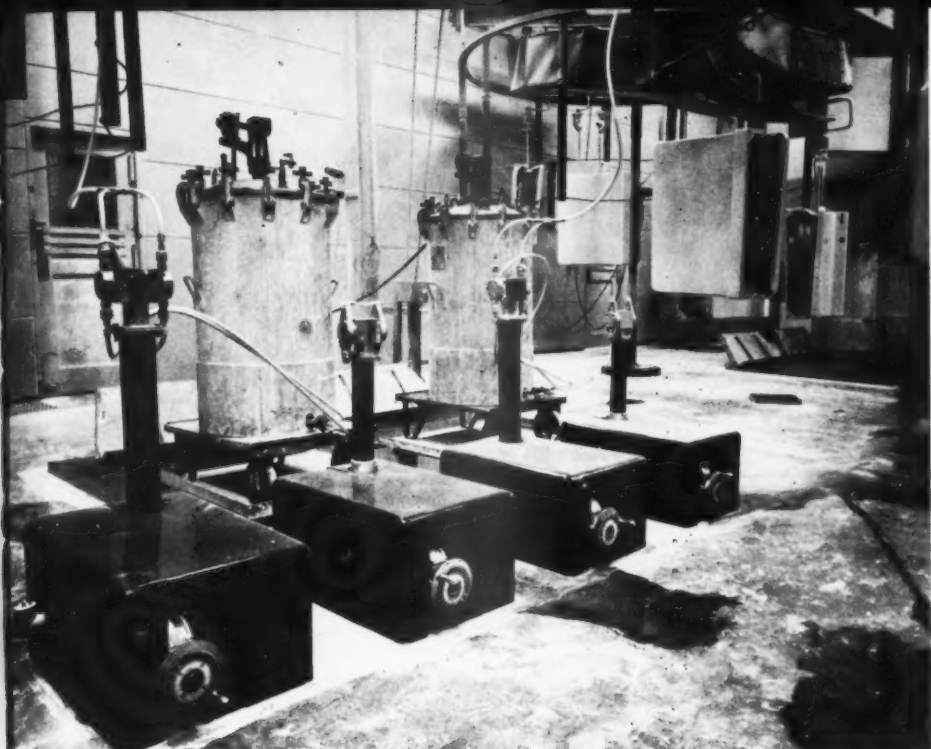
**ING-RICH RESEARCH and DEVELOPMENT** has been finding ways to improve porcelain enamels and better ways to apply them since the very beginnings of the industry. We have learned a lot about the enameling process in that time, and this knowledge is yours for the asking.

If you have problems about any phase of porcelain enameling which our specialized knowledge and research facilities might help solve, Ing-Rich will be glad to help you find the answer. We've been doing that for more than a half-century.

**INGRAM-RICHARDSON, INC.**

OFFICES, LABORATORY AND PLANT  
FRANKFORT, INDIANA





*These are the pump units which feed the porcelain enamel slip to the four atomizing disks in the Appliance Park operation. General Electric plant operators have reported that approximately 97% of the porcelain enamel is deposited on the parts as the helical conveyor makes a loop around the atomizing disk.*



*Wall mounted control cabinets for the electrostatic spray equipment is shown at the left. The control cabinets are centrally located as can be seen by noticing the center right of the picture where uncoated ware flows along the conveyor line, entering the humidity controlled room where the porcelain enamel is applied.*

## Electrostatic spraying

static field between the electrodes and the grounded parts repels any small amount of atomized material which may carry through between the parts. This not only confines the sprayed porcelain particles to the loop coating area, but also assists in depositing cover coat on the electrostatically shielded flanges.

### Some parts require hand reinforcing

Before electrostatically spraying their covers and lids, G.E. hand reinforces those surfaces where electrostatic shielding does not permit the field to deposit a complete coating.

The ware enters the first loop at the bottom of the spiral and proceeds clockwise around the disk. The helical conveyor carries it upward around the loop, which permits the application of a uniform coating from top to bottom.

### Ware coated bottom to top

In the second loop the ware moves counter-clockwise around the disk to apply a coating to the work on the opposite side of the hanger. Here, each part enters the loop at the top, and the spiral conveyor lowers it as it circles the disk. Therefore, the ware is coated from its bottom to its top surface.

Then the articles hanging from each side of the workholder proceed around spiral loops 3 and 4 to receive a second and final coat. This full coat is then dried as the ware passes through a convection oven. In the dry bisque state the parts are brushed as necessary, inspected and transferred to firing tools on the furnace conveyor.

### Fine grinding required

It has been found desirable to grind the slip more finely than usual. Less than two-tenths of one percent is retained on a 400 mesh screen. Contrary to the predictions of some ceramic engineers, the usual objectionable results such as "tearing" have been satisfactorily eliminated. It is preferable to maintain the clay content above 2%. Other normal additives do not seem to affect the results adversely.

Close control of relative humidity is desirable. Around 65% has proved quite effective. For a given composition and wetness of slip high humidity may produce sags, while low humidity may





**... and One of Industry's  
Most Modern Finishing  
and Assembly Lines**



If a stamped part goes into your product, Follansbee's Sheet Metal Specialty Division can offer you facilities that include design through assembly and packaging of the complete unit!

Modern equipment that will help reduce your costs will also put the best finishing touches on your product. Experienced engineers will work with you in designing or redesigning your component parts.

Call Follansbee engineers in early to discuss your stamping problems. A cost analysis on your job will be submitted without obligation.

## **SHEET METAL SPECIALTY DIVISION**



**Box 567 — Follansbee, W. Va.**

a Division of

**FOLLANSBEE STEEL CORPORATION**

Follansbee, W. Va.

produce either an excessively rough orange peel or some form of "tearing". Either the slip or the humidity may be adjusted to complement the other within wide limits. Close control of both reduces rejects and produces maximum quality.

Besides white the G-E home laundry department applies all five of their other standard colors — yellow, pink, turquoise, blue and brown — by this process.

Based on a G-E study of the industry's average performance, it is estimated that approximately three times as many parts per gallon of slip are coated electrostatically as would be coated by ordinary air spray. (About 97% of the atomized enamel is deposited on the ware; after 17 hours of operation almost no dry enamel may be found on the floor.)

Only one electrostatic operator and three touch-up men are required.

After the first few months the shop efficiency as measured by the amount of good ware has been as high as 95%. Experience points to an average well above 90% as a permanent standard.

Weight of applied enamel was reduced from about 33 grams per square foot to approximately 23. This was possible primarily because of improved coating thickness uniformity. It is hoped that further reductions in film thickness may be achieved.

In preparing the formulation, the hegman gauge was used as the most convenient and accurate means for measuring fineness of the grind.

Because of the lower application weight, rejected parts can be re-processed more times before being scrapped. This reduces the ultimate spoilage or scrap rate. Quality of appearance and damage resistance are improved. Furthermore, as there is no enamel overspray to be exhausted, the air make-up and heat loss are reduced.

A very wide range of production rates can be accommodated. For instance, with one atomizer it is estimated that ware around 30" in height can be coated at any conveyor speed up to 20 feet per minute.

Continuing development work has been directed particularly toward improving the flexibility and ease of adjustment for various sizes of products.



# *Nigron* } GENERAL PURPOSE BLACK ENAMEL

It's Versatile!...Fits any  
Production Schedule

Spray or Dip

Air Dry or Bake

Excellent Adhesion

Oil Resistant

Good Exterior  
Durability

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## 200 attend PMI's spring technical session

**every part of nation, and Canada, represented. U. S. Steel's Bay Estes points out prospering picture. Members hear urgent pleas to expand apprenticeship programs. PMI's Daschner outlines "merchandising the metal stamping industry".**

**S**AFETY, productivity and apprenticeship training took prominent parts in the 1956 spring technical session of the Pressed Metal Institute held March 14-16 in Cleveland. More than 200 representatives from the metal stamping industry were on hand for the session, with PMI's President J. J. Boehm formally opening the meeting.

The first session was on "Safety as A Productivity Factor" with J. R. Oviatt, president of the D. C. Oviatt Co., presiding. F. J. Dery and Dr. Howard C. Hary were speakers. Attending members were told how the Joint Industry Conference had made an approach to safety devices on punch presses.

### Honor companies for safety records

Bruce Krasberg, president of R. Krasberg & Sons Mfg. Co., presided at the first day luncheon where members heard G. F. Sullivan, *Iron Age* editor, speak on "What's Ahead for Industry". Highlight of the luncheon was the presentation of PMI's 1955 safety awards. For 1432 working days (since October 12, 1950) without a loss-time accident, The Kickhafer Mfg. Co. of Milwaukee was honored with an award, presented to Ernest Davis of that company. O. G. Bryte received the award for Follansbee Steel Corp.'s Sheet Metal Specialty Division, which has 512 non-accident working days beginning in 1954. Third company honored was the S & Z Tool & Die Co., Inc., of Cleveland for all of 1955 and up to the date in 1956 without a lost-time accident, with Clarence Miller receiving the award for the company.

### Safety programs that have worked

The first day's afternoon session concerned itself with safety. With Clifford Boeckler of the Niagara Machine & Tool Works, Buffalo, as moderator, members heard M. E. Provancher of Atwood Vacuum Machine Co., Michael Schuller of Youngstown Steel Kitchens and M. R. Blume of Wisconsin Tool & Die Co. Following these speakers a safety swap shop was held with the five categories chairmanned by Ed Lighton of *Flow* maga-

zine, H. S. Cronin of Liberty Mutual, Arthur S. Kelly of the National Safety Council, James Oviatt and George Stiles of Aetna Casualty & Surety Co.

The first day's session ended with a cocktail party in the Hotel Carter's vice presidential suite, hosted by PMI's Cleveland district.

### Outline growing economic picture

The growing economic picture was detailed in the first session of the Thursday meet by Bay E. Estes, Jr., Director of Commercial Research for U. S. Steel Corp. The six factors for the growing economy, listed by Estes, were (1) high level of employment and increasing personal income, (2) strength exhibited by the construction industry with nine straight years of increases, (3) strong demand for capital equipment, (4) probable rise in government spending (5) recovery and expansion of foreign countries, and (6) steps in Washington for monetary and credit policies to close any breach in the economic structure.

Following Estes, Howard Strong outlined the Rucker plan for engineering plant efficiency, told of example situations where the plan had been incorporated into producing plants and explained the results and betterments, employer as well as employee.

### Luncheon speaker a holy terror

Putting mirth into the metals meeting, Dr. Lawrence Hall of East Cleveland

*Gleeful appreciation of some remarks by Thursday Luncheon speaker Dr. Leonard Hall is well evidenced here.*



was the Thursday luncheon speaker. Dr. Hall told of his experiences in and out of the pulpit. Presentation of the John Woodman Higgins Award was made at this time. This \$500 prize, annually donated by the Worcester Pressed Steel Co., Worcester, Mass., was won by Francis B. Lord, owner of the Lord Machine Co. Lord's redesign may save as much as \$74,000 a year for his customers, it was pointed out.

Thursday's afternoon session was on "Methods for Reducing Press Set-up Time" with J. Kleinoder of Volkert Stampings, Inc., as chairman of the small light stampings division; J. J. Boehm, chairman for the medium heavy stampings division; Sam Morrison, president of Morrison Steel Products, Inc., chairman of light and heavy stampings division; E. T. Nolan, president, Advance Stamping Co., Detroit, chairman for the transfer and progressive stampings division; and Mel Lorentz, president of the HPL Mfg. Co., Cleveland, chairman for the small lot stampings division.

Friday morning the attending members visited the engine plant and foundry of the Ford Motor Co. at Cleveland, returning to the Carter for the luncheon which was chairmanned by H. A. Daschner, PMI's managing director. Dr. Tennyson Guyer was luncheon speaker.

The closing session of the meet had four speakers. They and their topics were: D. W. Clay, assistant to the executive vice president, Parish Pressed Steel Div. of Dana Corp., Reading, Pa., "A Practical Cost Reduction Program for Metal Stampings"; Leonard Giglio, supt. of finishing, Hartford Machine Screw Co., "Getting The Most from Your Finishing Dollar"; E. L. H. Bastain, director of production research, Shell Oil Co., New York, "Chemical Components of Drawing Compounds And Their Functions". Final speaker for the meet was PMI's Daschner who talked on "Merchandising The Metal Stamping Industry".

APRIL • 1956 finish

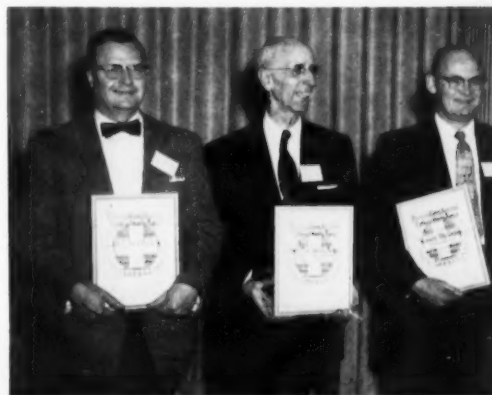


ATTENTIVE CROWD ATTENDED EVERY SESSION OF MEET



Holy terror raised at the Thursday luncheon was the offering of Doctor Laurence Hall of Cleveland, who, in a distinct and humorous style, made the audience laugh themselves into a sudden realization of the immeasurable value of human relationships.

Records of outstanding accomplishment in the field of plant safety were honored at the first day luncheon. The outstanding records are detailed out in the accompanying report. Here, proud bearers of the plaques which were presented their companies are Clarence Miller, S & Z Tool and Die Co., Cleveland; O. G. Bryte, Sheet Metal Specialties Division of Follansbee Steel Corp.; and Ernest Davis of the Kickhaefer Mfg. Co., Milwaukee.



Finish readers with the resultant advance outlook were well in evidence at the meet with Detroit, Michigan's Advance Stamping Co. officials W. Mart, J. Kuethen, Advance President E. T. Nolan and R. D. Nolan.

An urgent plea for apprenticeship training programs was expressed by Volkert Stamping's J. Kleinboder who said "Advancing technology calls for many more skilled men in the eras ahead, and we cannot survive as an industry with our present stature unless we create for our industry those skilled workers."



U.S. Steel's Director of Commercial Research Bay E. Estes presented a detailed outline of the growing economy and, in detail, told of the present day and prospective users of steel stampings in the period ahead. "Opportunities Unlimited" was the topic for Estes' speech which fulfilled the title's demands more than adequately.







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*Progress Is Our Most Important Product*

**GENERAL  ELECTRIC**

**New G-E Wall Refrigerator-Freezer  
puts all foods at your eye level.**

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LEADING APPLIANCE MANUFACTURERS know that durable Du Pont DULUX is a finish of *consistent* quality. Every shipment of this fine finish meets the *same* rigid specifications. And that's just one of the important cost-cutting, sales-winning advantages that DULUX offers.

Constant research by Du Pont chemists has resulted in a finish that gives more rugged resistance to chipping, cracking, scratching and staining. Application costs are lower, too—without sacrifice of quality appearance and dependable performance.

DULUX keeps its flawless appearance after years of constant use in the home. Its easy cleanability, resistance to wear and long-lasting whiteness help build the continued customer satisfaction so vital to the success of any appliance line. *No wonder so many of today's topflight appliance manufacturers use Du Pont DULUX Finishes.*

**E. I. du Pont de Nemours & Co. (Inc.), Finishes Div., Wilmington 98, Del.**



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# FAIRMONT

ALUMINUM COMPANY  
FAIRMONT, WEST VIRGINIA



## Producing a combination washer-dryer unit at We

detailed production routine for the Wash-'N-Dry Laundromat — fabrication, metal preparation, finishing and assembly at the Westinghouse Columbus, Ohio, plant



**T**HE Wash-'N-Dry Laundromat begins its manufacturing cycle in the steel storage area of the Westinghouse Columbus, Ohio, plant. All incoming steel is inspected. Control of quality at Columbus includes inspection for alloy content, size, tensile strength, hardness and surface. Later during shearing, stamping, forming, punching and drilling operations, inspections for size, depth of emboss, width and squareness of flanges, size and location of various holes, absence of die marks, burrs, dings and scratches are made on the first piece, plus periodic patrol piece inspection.

### Press forming operations

Sheets that are "approved for production" by Quality Control are delivered to the shear shop area where, after application of dry drawing compound, they are sheared to any one of the hundreds of sizes needed to make a washer-dryer. The component metal parts for the finished machine require blanking, piercing, forming, notching and trimming operations. The press shop forming operations range from an eleven die operation to form the complicated top to a single die operation that cuts a banding strap to proper length; or, from a multiple die operation to form the large body wrapper sheet to a two stage die operation to shape a small clip used on the service panel.

From the press shop area the parts that are to be porcelain enameled (the outer tub, the spinner basket and the heater and blower housing) are transferred to one fabrication area, while

the parts that are to be painted are conveyed to the 2nd floor welding area.

First operation on the sheet for the outer tub is blanking the vent hole and locating notch, the latter is used for reference in all the following manufacturing operations. The sheet is then fed into a set of pyramid rolls which forms it into a cylinder. Next the tub is mesh-seam resistance welded, and the seam weld wire-brushed on a special buffing fixture which simultaneously cleans both sides of the weld. Next the tub goes to an expander where it is stretched to exact size. During the expanding operation the machine also forms a flange on the back of the sheet that will be used for clamping the finished tub to the outer tub back. A sump hole is then blanked into the tub body on a horn press. The tub is next placed in a mash-seam welder where a cap is welded onto the front of the cylinder. Once again both sides of the weld are wire brushed in an automatic buffing fixture.

The next step in the manufacture of the tub body is the tacking in place of the condenser chamber which eliminates the necessity for venting the washer-dryer. Since the condenser chamber seams must be water tight, a circular-seam resistance welder is used for this metal joining operation.

### Welding on fixtures

The tub body is then placed in a fixture, and all the mounting and hanging brackets are gun resistance welded to it. After gun resistance welding, the brackets are also arc welded to the tub body. Arc welding is also used to seal the bottom seam of the condenser. The final welding operation joins the clothes chute to the outer tub cap. This is done in a double wheel seam welder.

The tub is inspected for leaks at the welded seams, burrs and sharp edges,



location of brackets, roundness and diameter of the tub and strength of all welded joints. If the tub is approved by Quality Control, it will be stored on a roller conveyor awaiting transfer by the delivery chain to the porcelain enameling section.

### Spinner basket fabrication

First operation on the sheet for the spinner basket is the forming of small ribs. A special hydraulic press is used to form the three large vanes which provide the washing action of the finished machine. The sheet is then rolled into a cylinder on a rotating drum, and the edges are tacked together

ENGINEERING DETAILS ON THE WESTINGHOUSE WASH-N-DRY LAUNDROMAT APPEARED IN THE DECEMBER, 1955, ISSUE

Westinghouse



by a gun resistance welder. Next the seam is welded on a longitudinal seam resistance welder. An expanding machine is used to stretch the body to size. Then a cap is welded to the basket body to give it rigidity.

A specially designed hydraulic piercing machine is used to pierce and extrude 1593 holes in less than a minute at 177 holes per stroke. These are drain holes for the spin cycle and provide for a uniform distribution of drying air during the drying cycle.

#### **Tub back assembly**

The back section of the tub is made up as a subassembly. First the hub washer assembly is welded to the tub

back by an automatic arc welder. This hub washer assembly (composed of a threaded nut brazed to a flat washer) forms the mounting axis of the basket, therefore, it must be accurately centered in the tub back. After the hub washer has been arc welded to the tub back, this assembly is then placed in a fixture where a diaphragm has been accurately located (with respect to the hub washer assembly), and the two parts are welded together by means of a submerged arc welder. When the diaphragm and tub back are welded together, they form the equivalent of a steel disc wheel, the difference being that the air space between the diaphragm and the tub back must be air tight to prevent water from

leaking in and causing rust. To inspect for this the assembly is charged with air, and the weld seam is covered with soap solution.

#### **Emphasis on concentricity**

The completed tub back assembly is first tack welded to the basket body and then seam resistance welded. All manufacturing operations are now complete on the spinner basket, and it is ready for inspection. The greatest emphasis is placed on concentricity. A shaft is placed into the back, and the tub is





*Press area where sheared sheets are drawn, formed, trimmed, and notched, to form tub backs: top, service, door and back panels plus other small parts such as supports, brackets, etc. At right: purposely undersized formed spinner baskets are expanded to proper diameter by means of this machine operation.*

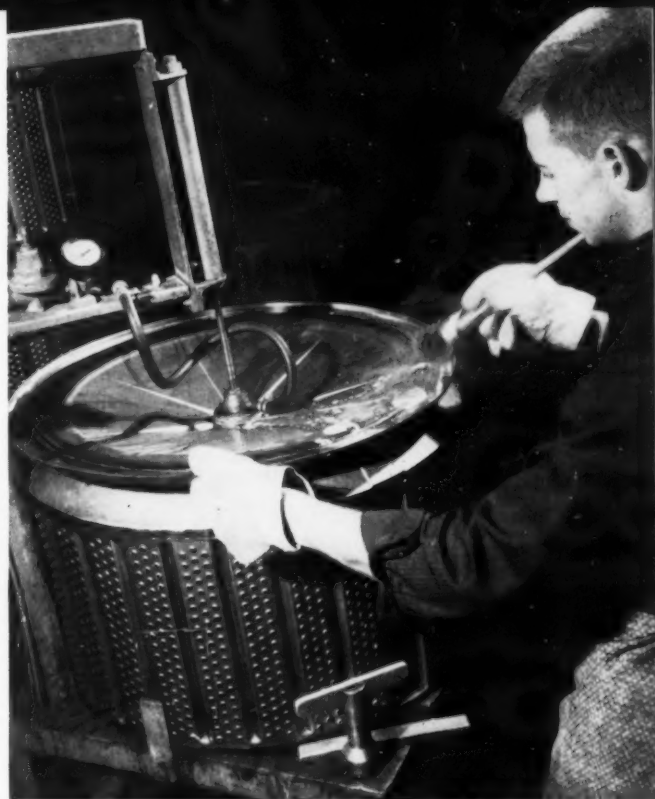


*Spinner baskets are rolled into a cylinder on this special rotating machine. First step is to corrugate a flat strip. The near press produces the three larger vanes that provide washing action. Cylinder is then welded and seam welded.*





*Concentricity check of every spinner basket is done in this operation. Baskets that are "out-of-round" by more than 3/32nds of an inch are rejected and re-processed.*



*Water tight test is given back section of each tub to be sure the weld joins the diaphragm onto the tub back. A soap solution is used, covering weld seam for test.*

rotated about it in a checking fixture. The edge of the basket opening must not be out of round more than 3/32-of-an-inch. This concentricity tolerance must be held to prevent rubbing against the outer tub during the washing and drying cycle. The tub is also checked carefully for any burrs, sharp edges or any other defect which could possibly tear clothing. When the basket is approved, it will be stored on a roller conveyor, then later transferred by an overhead conveyor to the porcelain enamel section.

The pre-cut sheet for the heater and blower housing assembly is formed on an air fixture into a "U" shape. The top is spot resistance welded in place, followed by a cut off and transition piece. The bottom and mounting bracket are welded on to complete the assembly. This assembly will be porcelain enameled to prevent deterioration and possible rusting due to the high temperature of the heaters.

#### **Porcelain enameling tubs/components**

After fabrication the three assemblies (outer tub, basket, heater and blower housing) are sent first through the automatic pickling machine where they are thoroughly cleaned, and a nickel

flash is used to assure good enamel adhesion. After this metal preparation they are dip coated with a special alkali resisting porcelain enamel. After dipping, the spinner basket is spun on a fixture to remove excess enamel from the many small drain holes and to assure proper thickness of coating. The parts are then dried at 225°F. and finally fired at 1540°F.

When inspection is satisfied and the enameled assemblies meet the standards set by the Sales, Engineering and Quality Control departments, the tubs and blower housings are sent by overhead conveyor to the assembly line.

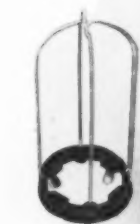
#### **Painted parts fabrication**

The painted parts fabrication area is on the mezzanine floor. Here all the subassemblies are resistance welded prior to finishing. One welded assembly found here is the bottom pan with the fill and spray valve bracket, the tee nuts for the equalizing legs and the shipping brackets. A second assembly is the drive unit mounting bracket which is first arc welded, then spot resistance welded for rigidity and finally straightened to assure alignment of the mounting surfaces. A third part is the outer tub back assembly. This is com-

posed of two concave discs — one shallow, one deep — resistance welded to form a disc wheel with a thick center section tapering to a thin outer edge. The hub is placed through the center section and welded in position on a pair of automatic arc welders. This hub, after bearings are pressed in, will form the support member for the



*Welding hub washer—composed of the threaded nut brazed to a flat washer—to back section of the washer tube is done in this operation.*



Lint Catcher —  
Laundromat Dryer

Here's how **Westinghouse**  
**TURNED**  
**PLASTICS**  
**INTO PROFITS!**

Indicator Body —  
Wash-'N-Dry  
Laundromat



Motor Pulley  
Slide — Laundromat



Condenser Housing —  
Wash-'N-Dry Laundromat

Pump Body —  
Wash-'N-Dry  
Laundromat

Westinghouse  
Wash-'N-Dry  
Laundromat



**THE PROBLEM:** To create high quality, light weight, non-corrosive, economical parts for the new Wash-'N-Dry Laundromat.

**THE SOLUTION:** Through the combined efforts of *General Industries'* Design and Engineering Departments and the Engineering and Purchasing Departments of Westinghouse, component parts molded of special plastic material were developed . . . which provided better performance at lower costs than the metal parts they replaced.

Westinghouse brought this problem to *General Industries* because Westinghouse had learned by experience that — *it pays to rely on GI*. Westinghouse and *General Industries* joined design and production talents to produce for the Laundromat, plastic parts which would not be affected by the corrosive action of certain detergents. *General Industries* engineering and design know-how backed by modern production facilities solved the problem, resulting in higher quality, lighter weight non-corrosive components and substantial savings, reflected not only in the cost differential between the new and the old part but also in freight charges of the finished product. When the new Westinghouse Wash-'N-Dry Laundromat was on the drawing boards, *GI* again helped to provide some of the answers to problems that always occur in the development of a new product. When you have a design and cost problem, you too, can turn "Plastics into Profits". *General Industries'* free design and engineering consultation facilities are at your service. Phone or write today.



**THE GENERAL INDUSTRIES CO.**

PLASTICS DIVISION — DEPARTMENT P • ELYRIA, OHIO

spinner basket. Other assemblies are the projection welding of the hinges to the front panel, mounting brackets to the service panel, banding strap, pulley and many others.

In this area a cabinet welding buck is used to accurately locate the various brackets and braces that give strength to the outer cabinet shell. The cabinets start as a flat, formed, pierced and trimmed sheet. An air-operated bending fixture forms the "U" shape which is then gun resistance welded in the assembly buck. After welding, the cabinet will move along a belt conveyor to the area where metal finishers grind and polish. All other exterior parts are ground and polished and carefully inspected at this location.

#### Organic finishing plus flow coating

From this area all the parts go through the automatic cleaning and phosphatizing machine. The parts then go to a unit which flow coats them with a synthetic epoxy resin finish. They then travel through a drain area and finally through an oven for baking. Parts which are used on the outer body of the Laundromat are next given a prime coat of paint, baked at 300°F. for 50 minutes, hand sanded and rubbed, and spray coated with a finish coat of white enamel. Finish coat baking is at 250°F. for 50 minutes. Finished parts go to the final assembly by overhead conveyor.

Before these parts leave the painted parts fabrication area, they are subjected to 100% inspection. Paint must be smooth. There can be no runs, no dents, no bumps, no marks, no dirt.

#### Tub components converge

Final assembly begins with the arrival of all the component parts at their proper points in the assembly area. First the water-air valve is assembled to the outer tub body. Then comes the drain hose, vent hose and damper springs. In an adjoining area the drive shaft is driven into the spinner basket, and a concentricity test applied. Then the outer tub back has the bearings pressed in, and a water seal and tub gasket put on. This precludes leaks at the spinner shaft or at the joint of the outer tub body and outer tub back. These three subassemblies meet at an assembly fixture where they are secured with a clamp ring. Along a short sec-

finish APRIL • 1956



*Cabinet inspection by quality control inspectors is done before cabinets are sent through the cleaning, phosphatizing and painting operation. Dimensional tolerance, squareness, flatness, dinges, and other minute irregularities are given a check.*

tion of roller conveyor the rubber boot is fastened in place, the blower and heater assembly are added, a condenser top is attached and the connector tube positioned to close the air circuit through the machine.

#### Test out tub assembly

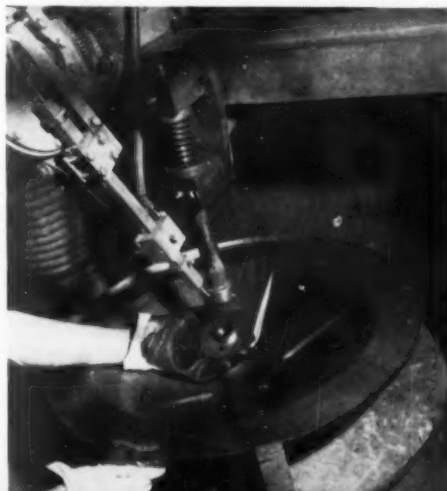
From the roller conveyor the tub assembly is hung onto an overhead assembly conveyor, where the complete drive unit — pulley, belt, bump switch plate and drain hose — are added. Next the overhead conveyor enters the inspection area where a "travelogue" ticket is placed on the tub assembly. This ticket will stay with the tub until

it is shipped as part of a completed machine. In this area the unit is filled with water and run as a check for leaks. A check is made for speed, belt tension, wattage, clearance of tub's overall operation and quality of enamel finish. If the ticket on the assembly is marked "O.K." the unit will be transferred to an assembly fixture to await the addition of an outside cabinet.

#### Outer cabinet assembly

First assembly operation for the outer cabinet shell is the installation of the wiring harness and controls. This assembly is then placed over the tub assembly, and the pivot rod is slipped

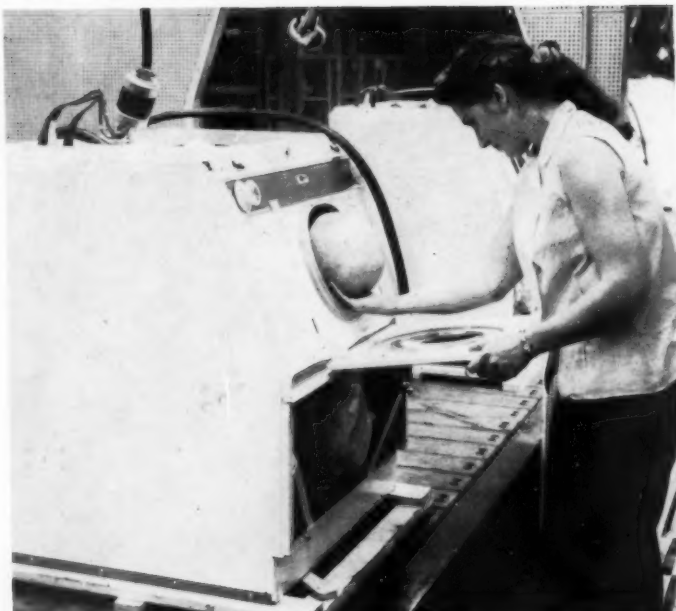
*A shaft hub washer must be attached to rear section with extreme care, since it will form the mounting axis for the spinner basket.*



*The diaphragm is welded, by use of the submerged arc process, to the back section of tub. Rigid finished tubs look like concave disc*







*Simulated washing test is done with a volley ball that has been filled with six pounds of water, to simulate the washing cycle, to check for possible rattles or noises.*

into place, fastening the two together. This entire assembly is lifted — by hoist — to the final assembly conveyor, where it is placed on a bottom pan and crate bottom. Assembled to the bottom pan as a subassembly are the fill valves, friction plate, leg equalizers and the fill hose and bump switch. Moving down the slat conveyor the washer-dryer becomes a working machine after the electrical connections are made and the front panel and drop door assemblies are added. Screws are tightened, brackets assembled and other miscellaneous parts assembled to finally complete the machine.

Scattered through this final assembly area are small subassembly sections. In one of these sections the front panel, water level control, and "Weigh-to-Save" door are assembled. Another section is used for the drive unit and pump assembly. Many other small assemblies are built on benches adjacent to the main assembly line.

#### **Final inspection and operating tests**

When all such subassembly operations are complete, and the machine has started down the final assembly conveyor, multiple inspection operations are performed by the Quality Control. Included are a check for grounds at 1100 volts, a wattage check, a check on the "Weigh-to-Save" door and visual

inspection of all connections and parts.

After visual and electrical checks the machine is loaded with eight gallons of water. The fill hoses are connected

to a controlled water source, and the final fill level checked. While the machine is running, leak checks are made. Then the pump is checked for operation.

#### **Test for smooth operation**

The machine next enters a sound tunnel where an inspector puts a volley ball filled with six pounds of water into the machine to simulate a load of wet clothes. The timers then will be advanced through their entire range while the inspector listens for noises and checks operating parts.

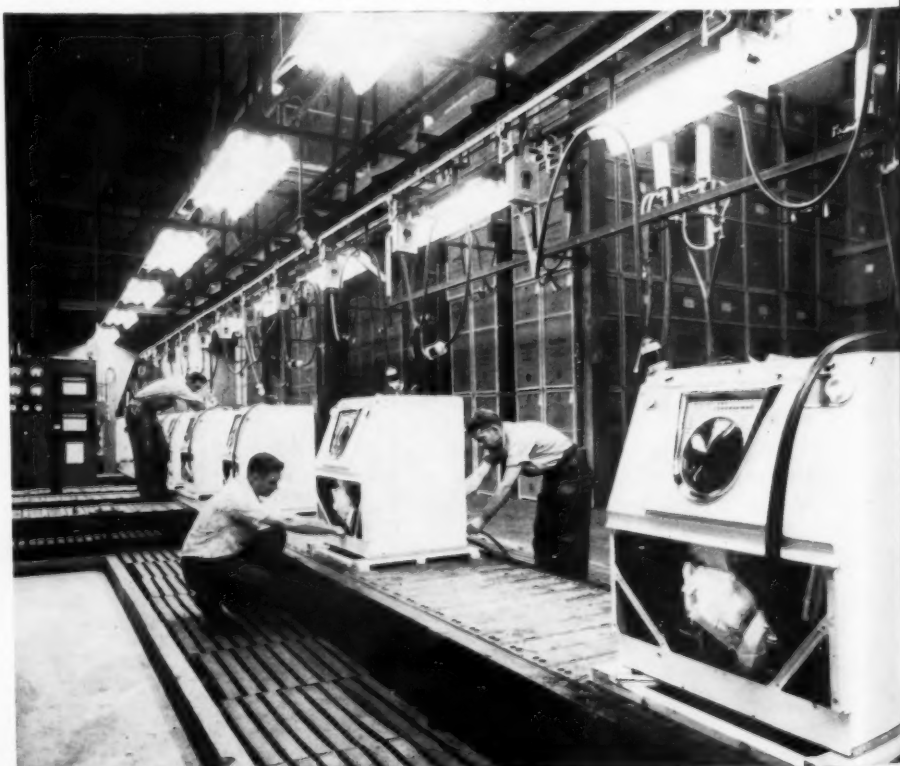
Adjacent to this conveyor is a station where finished machines are run through their complete cycle (using canvas as the load) to check the machine under actual running conditions. Five percent or a minimum of 12 machines are tested per shift.

#### **Quality control's "tunnel of light"**

After the mechanical and electrical checks are completed, the top panel, service panel and a back panel are attached. Then the machine must pass through the "tunnel-of-light" where any

*(Concluded on Page 83)*

*Final inspection includes a complete check of mechanical and electrical parts of each machine before the service panel is attached. Passing these final tests, the machines are crated and moved to the warehouse for future shipment to consumers.*



# HOT SPRAY is HOT NEWS!

DOMESTIC SERVICE Check the class of service desired wherever this message will be sent at a full rate telegram		WESTERN UNION		1300		INTERNATIONAL SERVICE Check the class of service desired wherever this message will be sent at a full rate	
FULL RATE TELEGRAM	SERIAL	W. P. MARSHALL, PRESIDENT		CHARGE TO THE ACCOUNT OF		DEFERRED	
DAY LETTER	NIGHT LETTER	FD OR COLT	CASH NO.	HOUSTON TEX		TIME FILED	
NO. ADS. CL. OF SVC.		PD OR COLT		61047A			
Send the following message, subject to the terms on back hereof, which are hereby agreed to							
H HTA 062 DL PD							
PRODUCTION SUPERINTENDENT							
YOUR PLANT							
INVESTIGATE IMMEDIATELY. PRODUCTION SAVINGS.							
USING SPEE-FLO HOT SPRAY HEATERS. HOT							
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720 POLK AVE.							
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**SPEE-FLO**  
HOT SPRAY  
HEATERS

720 POLK AVE. • HOUSTON, TEXAS

## SUPERIOR FINISH IN LESS TIME AT LOWER COST

OUR wide range of applications includes radios to kitchen cabinets, hot water heaters to new motor cars.

Let us prove to you with facts and figures how other firms in your field are using SPEE-FLO Hot Spray Heaters to reduce production costs with labor and material savings.

Faster application of high solids film permits one coat to do the job of two coats.

Material viscosity reduced by heat allows lower atomizing pressures . . . sharply reduced overspray cuts material consumption.

SIMPLE • EFFICIENT • MAINTENANCE FREE

*Don't Delay - Mail Today!*

SPEE-FLO Hot Spray equipment merits your consideration

THE SPEE-FLO CO., Dept. 1x-5, 720 Polk Ave., Houston, Texas  
Builders of practical industrial and automotive hot spray equipment.

Please send me information on your line of hot spray heaters best suited to our work. Type of products being finished \_\_\_\_\_

Application is conveyerized \_\_\_\_\_ turntable \_\_\_\_\_ mobile \_\_\_\_\_ other \_\_\_\_\_

Average volume of material per gun per hour \_\_\_\_\_

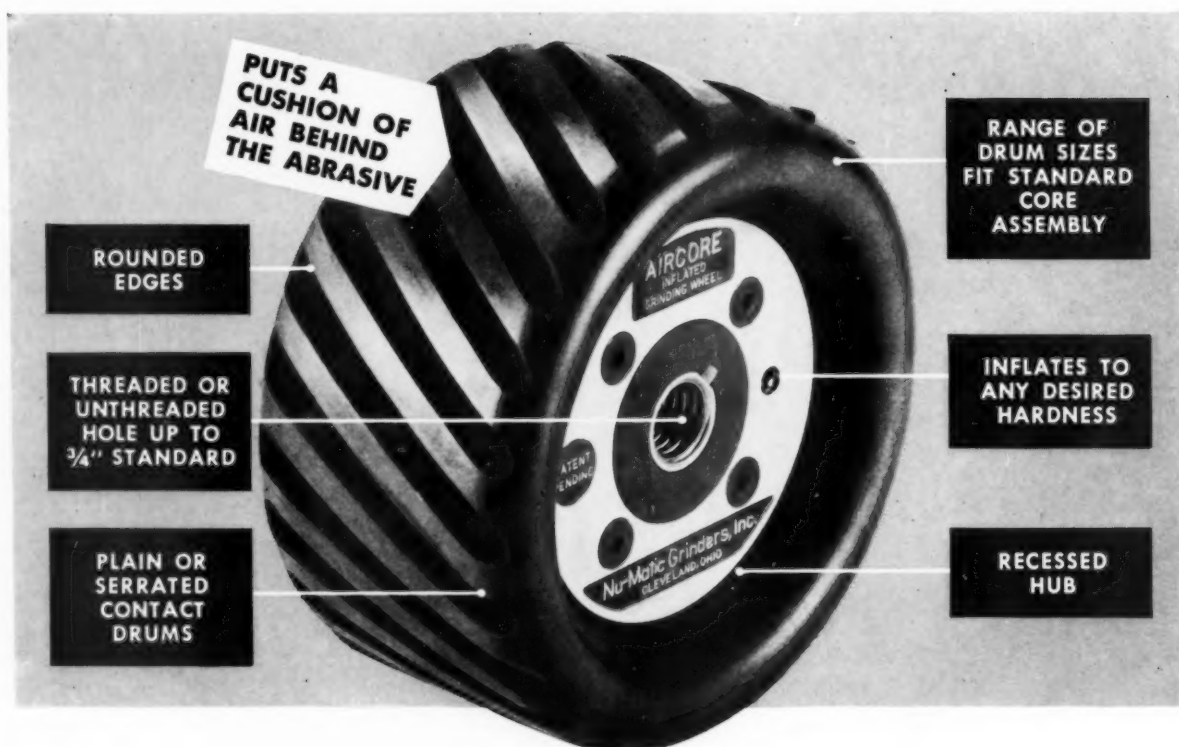
Type of material \_\_\_\_\_ Please have representative call \_\_\_\_\_

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_



## New Aircore Grinding Wheel cuts faster... features interchangeable contact drums

One universal core assembly and a range of contact drum sizes — these are the ingredients for a new line of Nu-Matic Air-Inflated Grinding Wheels. Changing contact drums is like changing from conventional tread tires to snow tread tires on your car. The new Aircore models provide these features:

**FASTER FINISHING**—With an Aircore Grinder, you get up to 3,000% greater abrasive contact area than with hard-wheel grinders. Means a greater area finished with each pass.

**BETTER WORK**—No herringbone patterns. No swirl marks. Aircore Grinder produces a smooth, straight-pattern finish comparable to a hand finish. Rough cutting and blending in one operation.

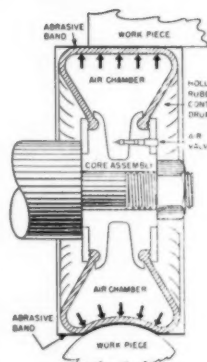
**INCREASED BELT LIFE**—Users report savings in abrasive costs up to 80%. Fewer grit sizes required in most cases.

**FOLLOWS CONTOURS**—The resilient contact drum shapes itself to the contour of the work surface — combines contouring with fast, smooth cutting.

**LIGHT WEIGHT**—The Model 525 weighs only 15 ounces. Size for size the lightest grinding wheel on the market.

**COMPARE AT OUR EXPENSE**—Send for 25-day free trial. Give job requirements and type and size power tool used.

**NU-MATIC GRINDERS, INC.**  
8224 Carnegie Ave. Cleveland 3, Ohio



The Nu-Matic Air-Inflated Grinding Wheel is built like an auto tire — flattens out at point of contact — contours to work surface.



Here you see the large grinding area that an Aircore gives on flat surfaces. A sheet of glass is pushed against an Aircore wheel that has been inflated to 3 pounds pressure.





## How to surface finish stainless steels

Part two of a two part report covering every facet of processing in the surface finishing of stainless steels, a methods and materials report.

by *W. E. McFee* • SUPERVISOR, PRODUCT INFORMATION SERVICE, ARMCO STEEL CORPORATION

Part one of "How to Surface Finish Stainless Steels" appeared on page 23 in the March issue of *finish*. In March the author analyzed stainless steels, the equipment and techniques necessary for abrasive finishing and gave a brief analysis of types of abrasive products now on the market. The application of abrasives was also discussed as well as a rundown of "Do's and Don't's" for shop practice in finishing stainless steel.

**B**UFFING usually follows polishing with a 240 or higher grit. In this operation the metal surface must be free of defects and deep scratches.

There are many excellent commercial buffs, ranging from concentric, radial arc, parallel and square sewed to loose buffs. Due to high buffing speeds and the toughness of stainless steels, special "ventilated" type buffs dissipate heat better and help prevent scorching.

### "Cutting" and "coloring"

"Cutting" is the first buffing operation; "coloring" the second. The first

requires a fast-cutting aluminum oxide stick or cake applied directly to the running wheel. The second uses a white compound of the levigated alumina type. Care should be taken to avoid sulphur — or iron-containing compounds.

Cutting should not exceed 10,000 surface feet per minute. For color buffing the top speed is 9,000 surface feet per minute. This especially applies to hand-buffing of odd-shaped pieces.

Stainless producers offer a "buffing quality" #2 finish strip with the correct fabricating temper and ready for immediate buffing. It can be brought



**Abrasive Cartridge**—these are used on a mandrel in a high speed portable tool and have proven out fast and effective for polishing and blending inside corners, the operation depicted in the photo. Cartridges are readily interchangeable.

**Tampico brush** finishes are mill-produced by brushing a #4 or higher polish with rotating tampico fiber brush loaded with fine abrasive and lubricant.

to a finish comparable to chrome plate simply by cutting with approximately 320 grit followed by color buffing with a stainless steel rouge. However, care must be taken when forming or drawing so the fine mill finish will not be marred.

A satin finish is not a buff but rather a fine polish. It is produced rapidly with special satin finishing compounds on a buffing wheel.

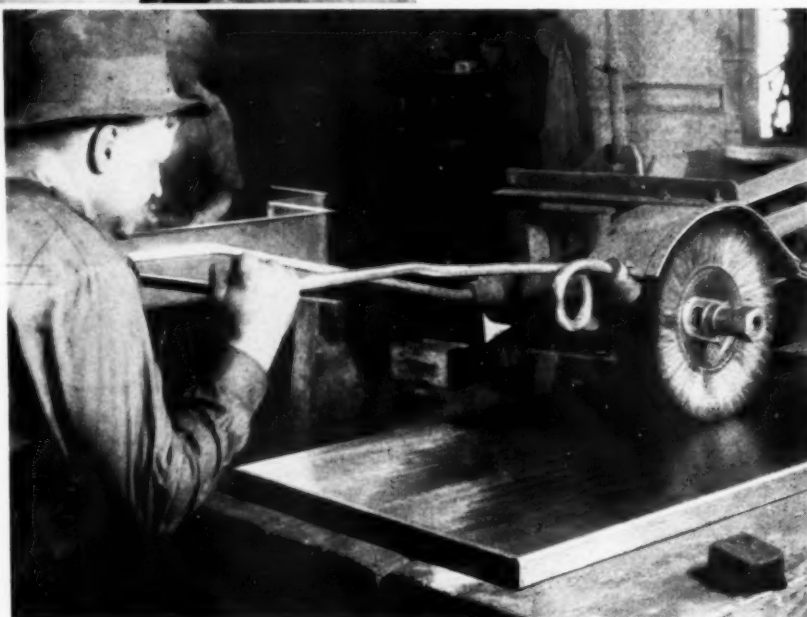
Loose sewn buffs are generally used with the finishing compound, a mixture of abrasive and glue binder, applied directly to the wheel. It dries quickly.

This satin finishing compound is used with finish strip to eliminate the one or more polishing operations usually before buffing. A complete study on special polishing procedures for stainless steel is presented in Table II.

Tampico brush finishes are mill-produced by brushing a #4 or higher polish with rotating tampico fiber brush loaded with fine abrasive and lubricant. The standard tampico brush finish is also known as #6 polish or "satin" finish. It has a smooth, dull matte appearance, is free from polishing scratches and offers reduced reflectivity.

The starting surface is important. Some work is even buffed before brushing. Many fabricators prefer to use a #2 finish stainless strip or #2-B finish sheets and apply tampico brushing only. This brushing procedure, using 150 to 180 grit and lubricant, develops a pleasing surface.

Both stationary and portable tools are used at speeds up to 5,000 sfpm. Compounds range from abrasive-lubricant paste or Italian pumice and kero-



sene with swing grinding operations to abrasive stick on portable tools.

Most desirable finish is obtained by applying brush lines in the rolling direction of the metal. Long strokes eliminate lap marks and help prevent spotty higher finishes. Table III shows the suggested special polishing procedures.

Usual practice in finishing weld beads is to snag off excess rod metal with a coarse grit rubber — resinoid-bonded grinding wheel on a portable grinder or fibre-bonded discs on a disc sander. Swing grinders and endless abrasive belts are effective on continuous surfaces. Carbide burrs are the fastest means of cutting away excess weld metal on inside corners.

Then, an application of #60 grit

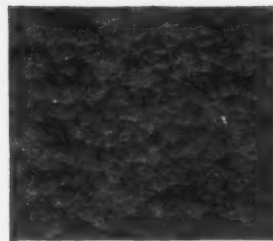
abrasive is made working up to a fine a grit as required to match the parent metal finish. To blend weld areas with a buffed mirror finish, the same compounds and procedures are used as in buffing the parent metal.

#### Inside corner finishing

After excess weld metal is snagged off, inside corners can be blended and polished with small diameter fibre or rubber-bonded wheels. Select wheels with radii just slightly less than the radius of the corner.

One handy and effective way to blend inside corners is by use of small abrasive cartridges or crosses or pads made of abrasive cloth by speed portable tool, using the regular progression of grits.

An effective way to polish small parts,



Unretouched photo shows detail of attractive, textured Hammerloid finish.



## NEW GLIDDEN ONE COAT HAMMERLOID

**gives rich, textured finish...cuts costs at Janitrol!**



Furnaces and cooling equipment located in recreation and utility rooms are often in the public eye. They must be compact and attractive. That's why Janitrol produces a year-round air conditioning unit that occupies little more space than a refrigerator. And with a beautiful, highly protective finish of Glidden One Coat Hammerloid!

One Coat Hammerloid meets all product requirements . . . permits fast application with important time and material savings,

fewer rejects. This durable baking enamel also offers maximum mar-resistance, uniform color, gloss and pattern. It will not sag or blister.

Glidden Technical Service Representatives worked closely with Janitrol to develop this formulation and assist in the installation of new finishing equipment. Chances are, Glidden can help you select a finish that will improve your production, add extra sales appeal to your products. Write now for details.



### INDUSTRIAL FINISHES DIVISION

11005 Madison Avenue • Cleveland 2, Ohio

SALES OFFICES AND FACTORIES: San Francisco, Los Angeles, Chicago (Nubian Division—1855 North Leclair Avenue), Minneapolis, St. Louis, New Orleans, Cleveland, Atlanta, Reading, Canada: Toronto and Montreal.

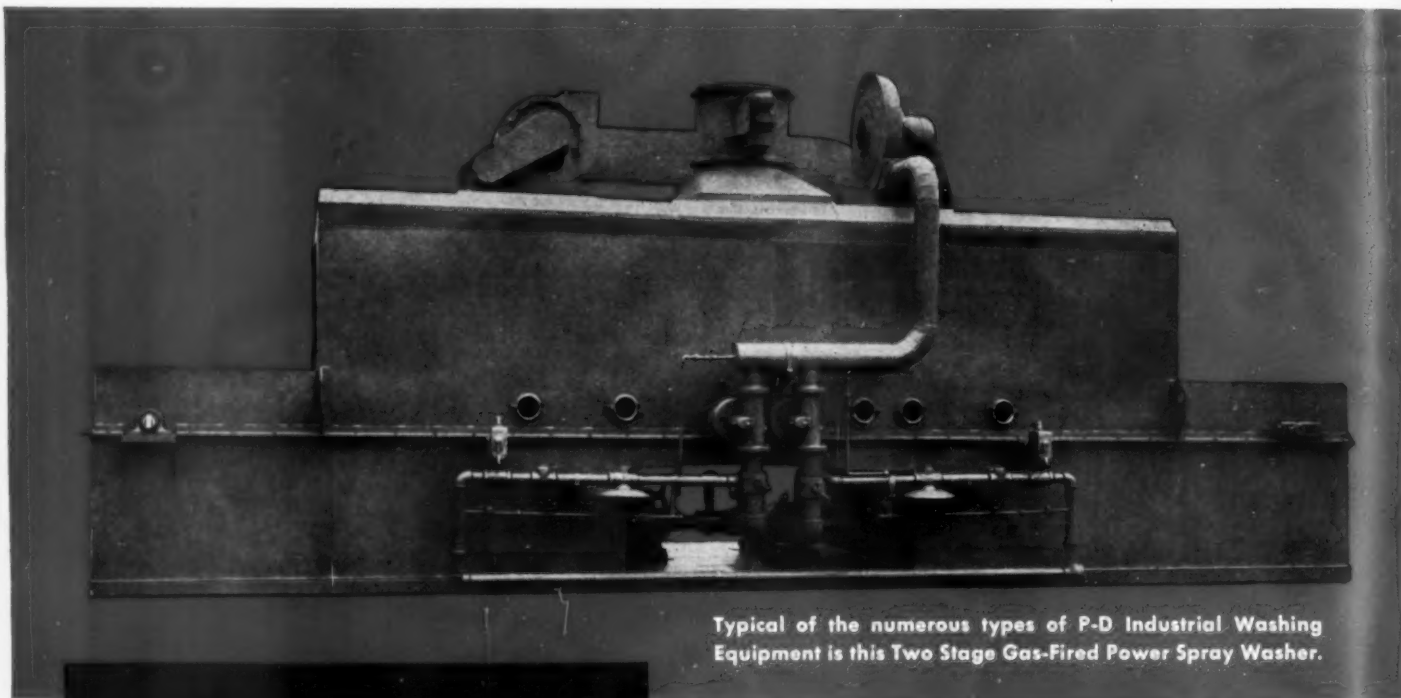




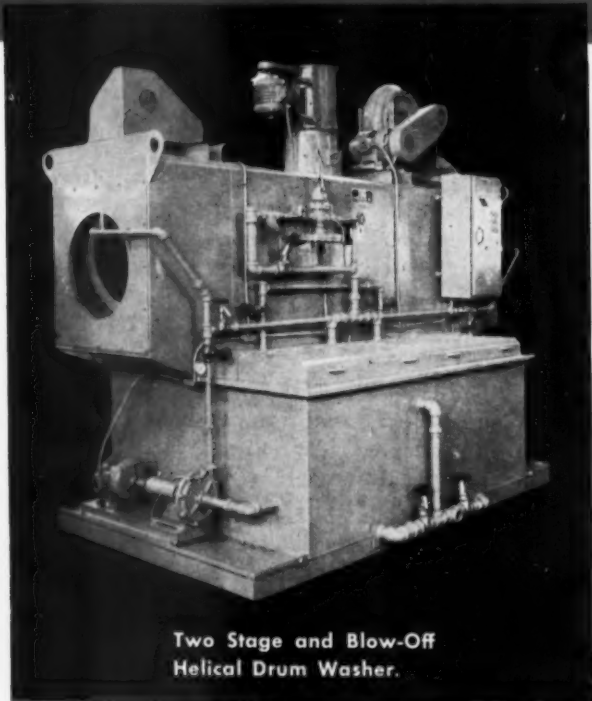
# CLEAN START for a FINE FINISH



## POWER SPRAY WASHERS EXCEL IN PARTS CLEANING and SURFACE TREATING



Typical of the numerous types of P-D Industrial Washing Equipment is this Two Stage Gas-Fired Power Spray Washer.



Two Stage and Blow-Off  
Helical Drum Washer.

Low in cost . . . high in efficiency . . . are these Peters-Dalton Two Stage Power Spray Washers. All sizes, types and required uses can be developed to meet your needs.

Regardless of the size or weight of your product, the proper cleaning and surface treatment for it can be developed by Peters-Dalton engineers and at lowest cost to you. This organization of specialists has for more than a quarter century met and exceeded the needs of customers in almost every phase of industry where finishing processes such as these are required.

Put your problems in our hands . . . give us the requirements you must have for the best and most economical way of cleaning or surface treating your parts. Just write, wire or phone . . . we'll be glad to tell you more.

**We'll be glad to tell you more. Just write, wire or phone.**





Representatives in principal cities.



**Peters-Dalton INC.**

A DIVISION OF DETROIT HARTFORD CO.

12000 Green Road - Detroit 12, Michigan

-  Hydro-Whirl Paint Spray Booths
-  Industrial Washing Equipment
-  Drying and Baking Ovens
-  Hydro-Whirl Dust Collecting Systems

and even some larger parts, is by barrel polishing. It is economical and can be done on a mass production scale. As contrasted to "barrel tumbling", a much cruder process, the work "flows" in a kidney-shaped curve while suspended or mixed on a polishing medium.

There are two principal steps in barrel polishing — cutting down or honing and ball burnishing.

#### Cutting or honing procedures

In cutting or honing the work is loaded into the polishing barrel with a mineral abrasive, water and usually a small quantity of soap. The operation removes and smooths down burred or rough edges and also eliminates light surface imperfections by abrasive action. Abrasives are classified according to size and physical shape, and each does its own special job. Aluminum oxide is one of the best, for its heavy weight gives efficient abrasive action while its toughness and hardness assure long life.

Total load of parts and abrasive should occupy one-half to two-thirds of the barrel capacity. Cutting action can be controlled by the volume of water. Low water level speeds up grinding and roughing. Adding water improves the finish but lengthens the time cycle for the operation.

Ball burnishing ordinarily does not remove metal. Rather, it develops a high luster on the stainless steel parts by the action of smooth-surfaced stain-

### Special Polishing Procedures for Stainless Steels

Table III

Desired Finish	Starting Finish	Operation Sequence	Abrasive	Type	Wheel Size	Speed — S. F. P. M.
No. 6 or Satin	No. 1	1	Aluminum Oxide Grit No. 60-80 <sup>*</sup>	Shop-Headed or Factory-Coated (Wheels or Belts)	12-14 S 5-6 P	6000-8000
No. 6 or Satin		2	Aluminum Oxide Grit No. 100-120 <sup>*</sup>	Shop-Headed or Factory-Coated (Wheels or Belts)	12-14 S 5-6 P	6000-6000
No. 6 or Satin		3	Satin Finishing Compound (Lea Compound ** Grade B)	Sewed Buff	6"	5000-6000
No. 6 or Satin		4	Learok Grage 304 B	Loose Buff	6"	6000-8000
Removal of Heat Tints	Heat Tints Welding	1	Nu-Steel Paste or Liquid	Tampico Brush	8"	2400-3000
		2	Nu-Steel Powder	Hand Clean with Flannel Cloth		
Wire Brush	No. 2D or No. 2B	1		Stainless Steel Brush		4000-6000

<sup>\*</sup> Use grease stick lubricant

<sup>\*\*</sup> Top dress with small amount of Learok Grade

304-B on the Lea Compound coating for lubrication.

less steel balls pressing and densifying the surface of the work. Steel cones, discs and pins are also sometimes used.

#### Ball burnishing

A good rule to remember is that the radius of the balls must be smaller than any radius in the work or the area will not polish. One-eighth inch balls are suitable for most production although smaller ones must sometimes be used.

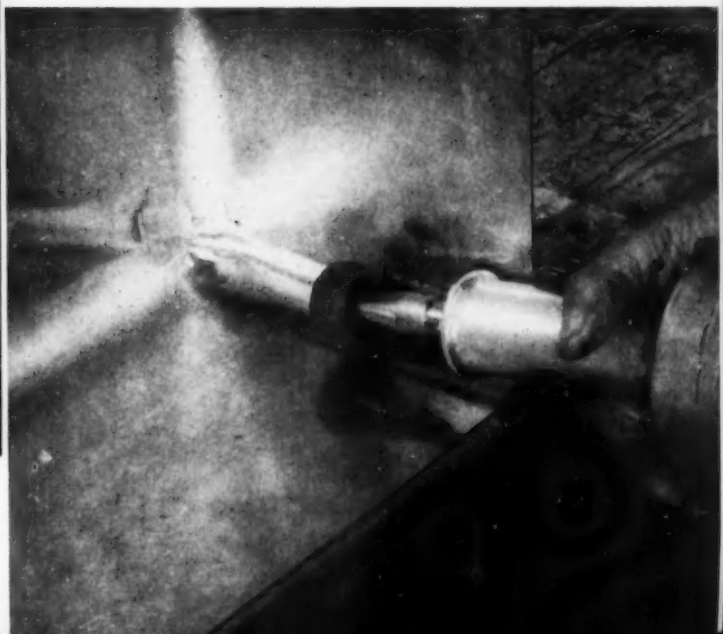
Customary procedure is to use two volumes of balls to one volume of work.

The barrel is filled to two-thirds of capacity, and enough water is added to cover the work by about an inch. A few ounces of burnishing soap are added for lubricant. Wood-lined steel barrels are commonly used, rotation of drum runs from 30 to 60 rpm, and the operation takes from 1 to 8 hours.

Another method consists of using Vienna lime in place of soap in an unlined steel barrel. This is a longer process because of the mild abrasive action of the lime.



**Portable Disc Sander** — this unit has served well as a tool for refinishing.



**Small Vitreous Wheel** — this is used for grinding down the inside corner weld bead, with a portable electric tool.

# finish ... ... foto-news

on the theory that one photo equals a thousand words, this new *finish* feature will bring you many photos and few words about people and products

**Nonchalant Maytag Dealer** Stuart Greenley, owner of one of the nation's largest Maytag dealerships, gets a "quiet" welcome to Newton, Iowa, as he, with a sixteen man delegation from his five retail stores, arrives at Des Moines to take part in Maytag's "Operation Maytag"—a program set to acquaint dealers with the methods of manufacturing Maytag products



**Wrap-around display banner** being used by Mirro dealers' this spring is shown above. 100 feet long, the banner is part of the spring sales kit.

**Perky and Pretty**—new Universal's 10-cup Chrome Coffeematic is presented to Miss 1956 Coffeematic as plans get underway to take full advantage of the '56 sales opportunities (See Forecasts on pages 30-31) for electrical appliances.



**75 Years** in the household refrigerator business is honored by the Brand Names Foundation with a certificate, honoring the American Motors Appliance division, being presented to Vice-President—Appliance Sales Walter Jeffrey by BNF Henry Abt.





**The Name's the Same**—Inter-state United Coffee Corp. Board Chairman Rosenbaum asserts, about the new Perk-O-Fresh coffee vending machine his company produces. Unit contains 16 percolators, brews up 16 cups at a time. Result: fresh coffee all of the time. Finish editors are now working on presenting full details on the manufacture of the unit. Look for the manufacturing report in an early issue.




**Cleaning up**—with a new toy vacuum cleaner that really works, The Aluminum Goods Mfg. Co., of Manitowoc, Wis., is creating top interest in their Mirro line with what is considered their most spectacular models. The 10½" long cleaner being operated by the lady above (Price \$5.95) is only one of the new ideas.



**South Africa Activities**—include use of the services of Gas Consultant Leland S. Weimer, assisting the Durban Falkirk Iron Co. Ltd., in the manufacture of their LP-gas line of stoves—first such type unit manufactured in that area, according to Durban's A.M., W. W. Ferguson.



**10,000 Penny Question**—and lots of enjoyment were part of the 14th annual banquet of the Union Steel Products Co., Albion, Mich., Old Timers Club. Above, Union's Bill Neumann pops the question as 25-year man Don McCullough sweats out an answer. Editor Dotti Bennett, of the Union Steel Messenger, supplied the pix and while she gave us no clues as to the questions asked, she did assure finish that the consolation prize was "not" a Cadillac.



**Adaptable** to your finishing operation

# Guardsman<sup>®</sup>

## GLOGARD ENAMELS

**TYPE:** Alkyd-Amino Resin

**GLOSS:** Good

**COLOR:** White and tints

**HIDING:** Solid in one coat on steel

**APPLICATION:** Spray (reduce 5 parts enamel with 1 part SC #2 or Exlol)

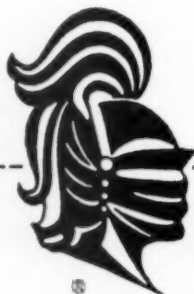
**HARDNESS:** HB to H pencil depending on formula

**BAKE:** 10 to 30 min. at 300° or  
5 to 15 min. at 325°  
(varies with formula)

**ADHESION:** Good

**COLOR RETENTION:** Good

**USES:** Cabinets, water heater jackets, metal furniture and table. Also ideal for stools, containers, and other metal specialties wherever you require a high quality competitive finish.



---The Better the Finish, the Better the Buy---

**GRAND RAPIDS VARNISH CORPORATION**

MAKERS OF THE FAMOUS Guardsman<sup>®</sup> FINISH AND Guardsman<sup>®</sup> CLEANING POLISH

**GRAND RAPIDS, MICHIGAN**

# MCDANEL

## MILL LININGS AND GRINDING BALLS



These 8 ft. ball mills are ready for shipment by the manufacturer. They are completely lined with McDanel Super High Density Brick and equipped with McDanel Mill Head Assemblies for long life and satisfaction.

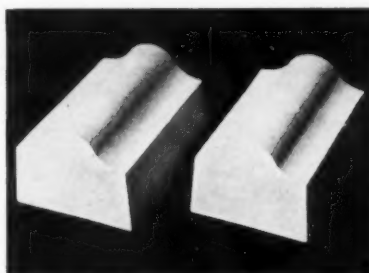
### ***An Unbeatable Combination That Gives You More Production At Less Cost!***

- This ball mill is being lined with McDanel Super High Density Brick. Notice the smooth surface and the broken joint installation—a time-proven method used by brick masons for centuries for greatest strength and durability. We've made and tested it for years. Customer satisfaction and repeat orders tell us that it's saving users time and money. McDanel Super High Density Brick is harder, stronger, more uniform and longer lasting. 1-1/2", 2", or 2-1/2" thicknesses available. Better check on McDanel Super High Density Brick today!

- McDanel Ceramic Grinding Balls are known in many fields for their long wear, extreme purity, superior impact resistance and uniform grinding quality. Made from a scientifically developed body with constant control during manufacture and rigid inspection. Any pick-up due to wear is uniform and compatible for most products. Investigate them today!

### **MCDANEL SUPER HIGH DENSITY LIFTER BARS**

Made of the same strong, long-wearing body as the high density brick. Aid in cascading ball charge for more efficient and faster grinding. Long-lasting. Specially designed and tested for proper contour.



**MCDANEL**  
*Industrial*  
**CERAMICS**

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**REFRACTORY PORCELAIN<sup>®</sup> COMPANY**  
**BEAVER FALLS • PENNSYLVANIA**

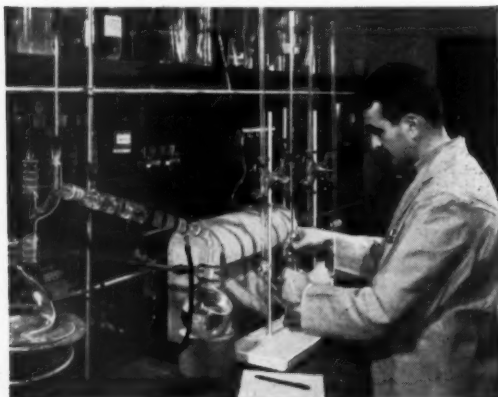
Send for information on McDanel High Density Mill Linings and Grinding Balls. Ask for Bulletin B1-55. Do it today!



# Pittsburgh offers you the skill and experience of 415 Finishes Technologists



● Pittsburgh Plate Glass Company's new Paint Research Center at Springdale, Pa., contains the most modern laboratories devoted exclusively to the creation and experimental production of new finishes.



● A necessary part of research and development is the creation of new chemical vehicles to improve industrial finishes for many types of products.

You can get superior finishes for your products and more efficient ways to apply them . . . without increasing your payroll.

**TO HELP YOU** get consistently better finishes for your products, Pittsburgh now offers you the most modern facilities for fundamental and applied research in the paint industry.

● In its new Paint Research Center at Springdale, Pa., and in the development departments of its 11 paint plants, Pittsburgh maintains a staff of 415 highly trained chemists, engineers and technicians. The creative work of this group is supported in a practical way by an experienced field sales and service staff.

● Objectives of this group are: 1) to make better finishes for *today's* products from existing materials; 2) develop new finishes for *tomorrow's* goods from new chemical compositions and; 3) devise more efficient ways to *apply* these finishes.

● Bring your finishing problems to us. You can have the benefit of our facilities and the creative ability of our technologists to help you develop superior coatings without adding to your payroll. Pittsburgh Plate Glass Company, Industrial Finishes Division, 1 Gateway Center, Pittsburgh, Pa.

## PITTSBURGH PAINTS

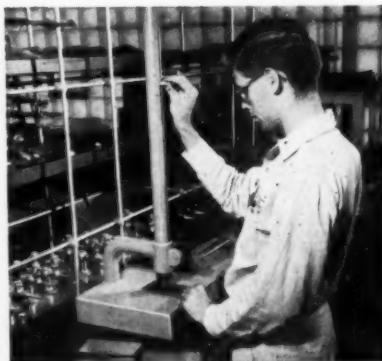
PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS • FIBER GLASS

**PITTSBURGH PLATE GLASS COMPANY**

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED



● Resistance to corrosion from moisture, humidity, salt spray and detergents is checked by a series of immersion baths.



● Flexibility, adhesion and toughness are measured by severe impact tests under extremes of temperature and humidity.



● Test panels are baked in gas-fired ovens to reproduce conditions found in various types of industrial applications.



### FLORENCE PRESIDENT RESIGNS

Florence Stove Co., announces that Robert H. Taylor has resigned as president and member of the board of directors. Taylor joined Florence in 1932 as a salesman and became president in 1948.

### CARRIER ELECTS WAMPLER CHAIRMAN; BYNUM, PRES.

The board of directors of Carrier Corp., Syracuse, N.Y., has elected Cloud Wampler, formerly president, chairman of the board. He will continue as chief executive officer.

William Bynum, executive vice president, was elected president and will be in charge of operations.

### PHILCO'S CARMINE TO RETIRE

James H. Carmine, president, Philco Corp., has announced that he will retire as president in April.

He will continue to serve on the board of directors and finance committee and will serve as special consultant on sales and merchandising.

### GENERAL ELECTRIC SALES UP 5%

General Electric Co., Schenectady, N.Y., sales totaled \$3,095,352,063 in 1955, President Ralph J. Cordiner announced. This was 5% over 1954 sales of \$2,959,077,548.

### KEY ROPER APPOINTMENTS

Geo. D. Roper Corp., Rockford, Ill., has announced the appointments of John H. Makemson, formerly vice president and general manager of the appliance division, to executive vice president and general manager; L. R. Jensen, formerly vice president in charge of operations, to vice president and appliance general manager; Norman C. Kreuter to vice

president and appliance sales manager; and Charles A. Miller, formerly comptroller, to assistant treasurer.

H. D. Weigel, ordnance general manager, has been named director of engineering.

### MAYTAG '55 SALES UP 15%

The Maytag Co., Newton, Ia., has recorded net sales for 1955 at a new high of \$93,067,185, 15% over net sales of \$81,055,647 during 1954.

### CULLIGAN EXPANSION

Culligan, Inc., Northbrook, Ill., is undertaking its third expansion program in two years. The new plant addition will increase floor space by 40,000 square feet and permit a 60% boost in production, according to Harold F. Werhane, president.

### WORTHINGTON NAMES WOLF

Herbert Wolf, formerly product engineer, has been appointed chief engineer, Worthington Corp., Air Conditioning & Refrigeration Div., research and development, according to J. E. Lancaster, manager of engineering.

### W. H. RIETZ IS ILG PRESIDENT

W. H. Rietz has been elected president of Ilg Electric Ventilating Co.,



W. H. RIETZ

Chicago. He was formerly executive vice president. J. M. Frank, formerly president, has been elected chairman of the board.

J. J. Friedler, vice president of sales, has been named executive vice president. Charles F. Rietz is vice president of production; Robert E. Parker is vice president of research, and S. E. Heyerick is vice president in charge of purchasing.

### U. S. AIR CONDITIONING VP

Meyer Rosen has been elected a vice president of the United States Air Conditioning Corp., Minneapolis, announced David E. Feinberg, president. Rosen was president of Floral City Heater Co. until its recent acquisition by usAIRco.

### HOME LAUNDRY SALES UP

Home laundry appliance factory sales for January amounted to 564,923 units, 8% greater than December 1955 and 17% over January 1955, according to Guenther Baumgart, executive director, American Home Laundry Manufacturers' Association.

### MAGNAVOX BUYS ASSETS OF SPARKS-WITHINGTON UNIT

Frank Freimann, president, Magnavox Co., Fort Wayne, Ind., has announced the purchase of certain assets of the Sparton Radio-Television division of Sparks-Withington Co.

### CROSLEY-BENDIX UPS HUDSON

Wayne D. Hudson, formerly supervisor of methods and standards for Crosley and Bendix Home Appliances, Nashville, Tenn., has been named staff assistant to vice president and director of manufacturing, John Mihalic.

### WHIRLPOOL-SEEGER '55 SALES

Whirlpool-Seeger Corp., St. Joseph, Mich., has announced net sales of \$280,362,765 for the calendar year ended December 31, 1955.

### KONEMANN TO PRIZER-PAINTER

Clarence Konemann, formerly enamel superintendent for Caloric Appliance Corp., Topton, Pa., has been named enamel superintendent for The Prizer-Painter Stove Works, Inc., Reading, Pa., according to L. E. Bilger, president.

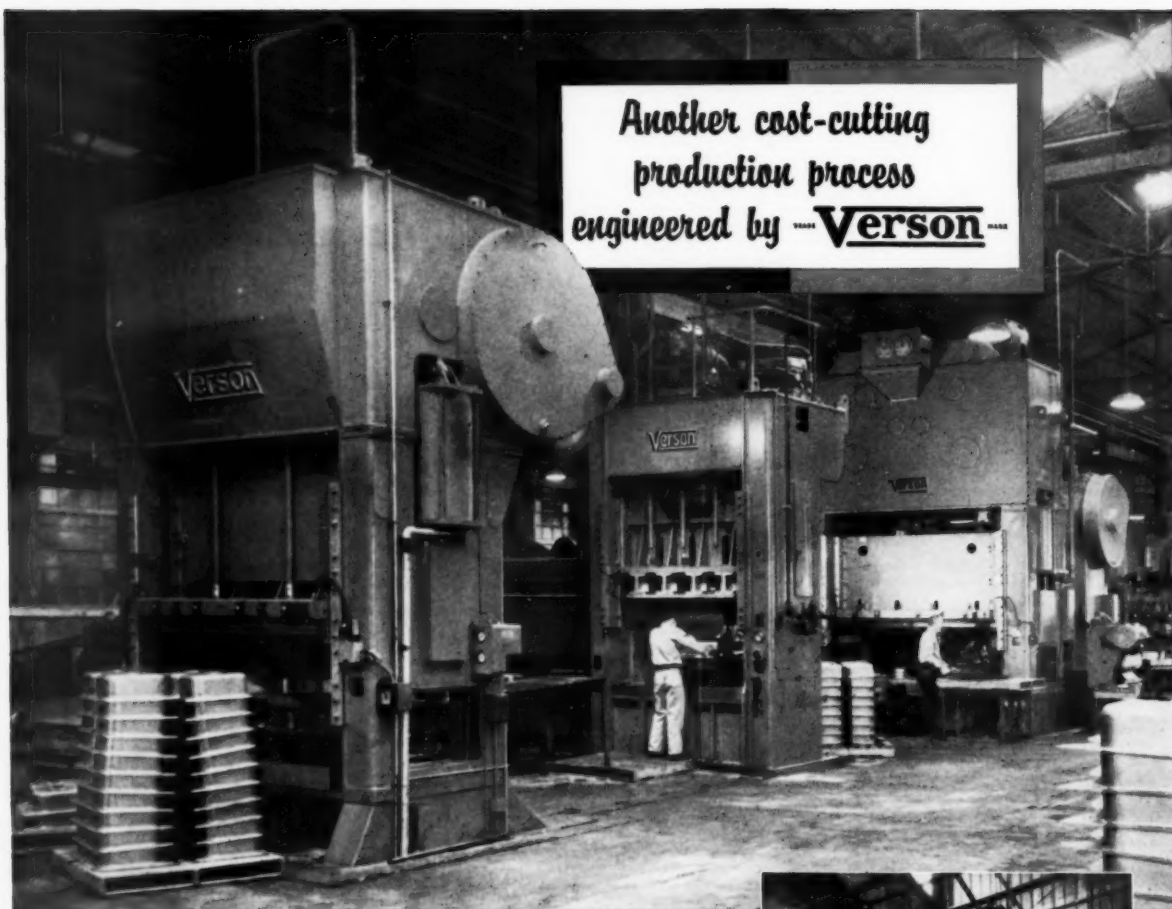
### '55 OIL BURNER SALES

A total of 817,000 residential type oil burners were sold in 1955, 9% over 1954, according to Plumbing and Heating Industries Bureau.

### FEDERAL SIGN 1955 FIGURES

Federal Sign and Signal Corp., Chicago, has reported net income of \$663,498 for 1955, as compared with \$605,358 for 1954. Net sales and other revenue climbed to \$10,644,788, 5% over the prior year.

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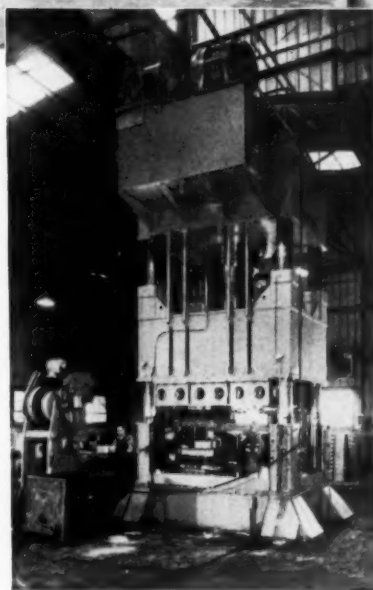


## This **Verson** line-up cuts costs on double sump sinks

• The press line illustrated above, part of the final operations in forming double sump sink units before porcelain enamelling, includes Verson eccentric, hydraulic and crank presses. Previous operations on the sinks include deep drawing the sumps to a depth of  $7\frac{3}{8}$ " from 14 gauge Armco deep drawing stock on a 1000 ton Verson hydraulic press and piercing and embossing the center drain hole in the sinks on a Verson O.B.I. Both of these presses are shown at the right.

This is more than just a line-up of Verson presses . . . it's a production process engineered by Verson to cut costs as an integrated part of the complete manufacturing program. Verson has the experience and facilities to meet the most exacting press requirements . . . and the "know how" to blend these presses into an efficient and practical production process.

Put Verson facilities to work for you. Send an outline of your production requirements.



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## NEWS

→ from Page 67

### 1955 BEST YEAR IN

#### BORG-WARNER'S HISTORY

Borg Warner Corp., Chicago, reports 1955 was the largest year in sales and in earnings before and after taxes in the history of the corporation.

Sales volume exceeded one-half billion dollars for the first time, totaling \$552,192,430, compared to sales of \$380,317,341 in 1954, an increase of 45.2%.

### GAMA JANUARY FIGURES

Automatic gas water heater shipments in January were 7.5% over the same month last year, according to Edward R. Martin, director of marketing and statistics, Gas Appliance Manufacturers Association.

Domestic gas range shipments were 1.9% less than the shipments for January 1955.

Shipments of gas-fired warm air furnaces set a new January high of 57,500 units, 13.4% above January 1954. Gas boiler shipments totaled 4800 units, 29.7% above last January.

Manufacturers' shipments of gas ranges, water heaters and central heating equipment will probably pass the seven-million-mark in 1956 for the first time in the industry's history, according to a survey conducted by the Association.

### PRITCHARD IS G. E. VP

Charles R. Pritchard, general manager of the General Electric Supply Co. Div., has been elected vice president of General Electric Co., announced President Ralph J. Cordiner.

### 1000 NEW RAYTHEON DEALER-SHIPS IN 30 DAYS

More than 1,000 new dealerships have been added to the television and radio operations of the Raytheon Mfg. Co., Chicago, in a thirty-day period, it was announced by Henry F. Argento, vice president and general manager.

### SYMPOSIUM ON SHAPED DIAMOND TOOLS

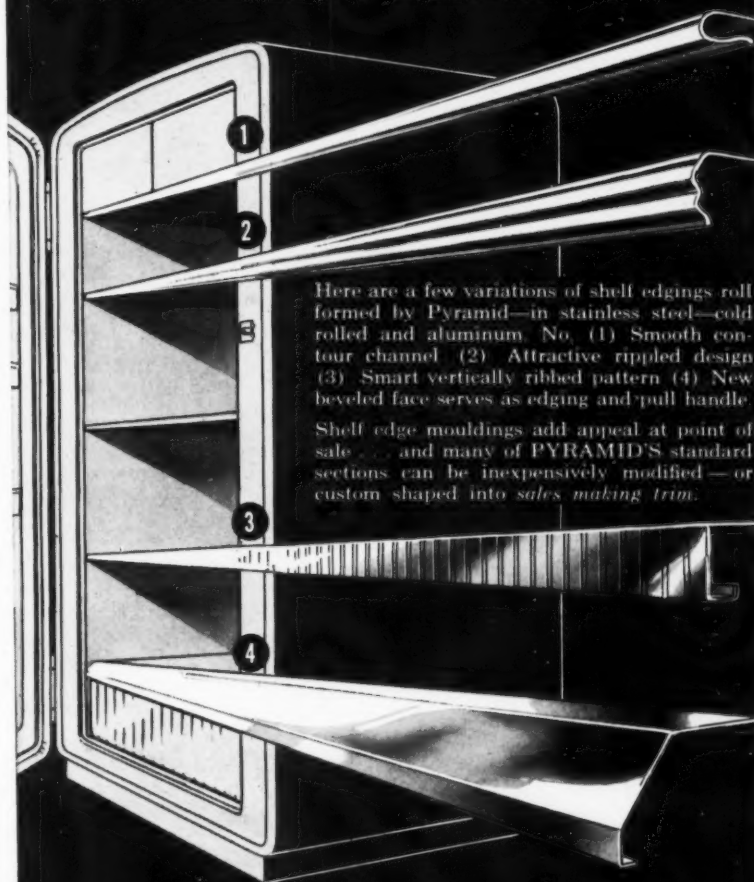
The use of diamonds as tools, rather than as gems, will be the subject of a symposium at the International Amphitheatre in Chicago on March 19-21.

The symposium is being co-sponsored by Armour Research Foundation of Ill.

to Page 70 →

finish APRIL • 1956

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Institute of Technology and the American Society of Tool Engineers, as part of the latter's annual convention and exhibition.

### YOUNGSTOWN KITCHENS

#### SPONSORS QUEEN FOR A DAY

Youngstown Kitchens Div. of American Radiator & Standard Sanitary Corp., Warren, Ohio, is sponsoring a weekly quarter-hour segment of NBC-TV's daytime show, Queen for a Day.

A closed circuit telecast originating from Hollywood was presented for distributors, dealers and the press on March 6. C. D. Alderman, vice president in charge of sales, M. L. Ondo, general sales manager, Jack Bailey, Queen for a Day MC and members of the regular cast appeared on the telecast.

### GAMA ELECTS NEW MEMBER

Harold Massey, managing director, Gas Appliance Manufacturers Association, has announced the election of R. D. Spickler Co., Inc., Mamaroneck, N.Y., manufacturers of gas water heaters, to membership in the association.

### WHIRLPOOL-SEEGER NAMES

#### BRICKER MARKETING HEAD

Appointment of John L. Bricker to the new position of director of marketing for Whirlpool-Seeger Corp., St. Joseph, Mich., has been announced by John A. Hurley, vice president.

Bricker, formerly director of merchandising for Colgate-Palmolive Co., will be responsible for sales, advertising, merchandising and market research.

**Tour of Hotpoint Home Laundry plant**—highlighted a recent meeting of the Midwest Enamelers Club. According to A. J. Holloway, president, there were 113 men in attendance. At the speakers' table before the tour were, from left to right, S. N. Smith, Ferro Corp.; John McLaughlin, Allied Porcelain, Inc.; Burt Holloway, Lawndale Enameling Co.; Otto Novy, Chicago Vitreous Corp.; and Jim Tustin, Rheem Mfg. Co.



## 3,000,000 MAN HOURS WITHOUT LOST-TIME

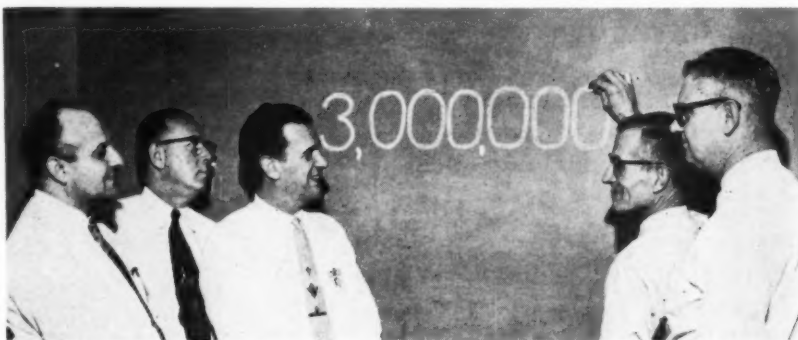
### ACCIDENT AT CROSLEY AND BENDIX PLANT

A factory safety record of 3,000,000 man hours without a lost-time accident has been surpassed at the Crosley and Bendix Home Appliances plant in Richmond, Ind.

Announcement of the record was made to employees by Works Manager J. D. Taylor, Jr. He said as far as could be determined the safety achievement was a new industry record for a refrigeration manufacturing facility.

(The Bureau of Labor Statistics reported the refrigeration industry average number of lost-time accidents per 1,000,000 man hours in 1955 was 7.2.)

More than 2,500 employees compiled the record in the plant which has approximately half a million square feet of production space, used to produce domestic refrigerators and freezers and items for the Air Force.



Officials of the Crosley and Bendix Richmond, Ind., plant celebrate the achievement of 3 million man hours without a lost-time accident in the refrigerator and government products plant. Left to right, Harold Kocher, production superintendent, government contract work; Edward Herrmann, production superintendent, refrigeration; C. R. Irvine, assistant works manager; Ernest Darby, safety supervisor; and J. D. Taylor, Jr., works manager.

### HOUSEWARES EXHIBIT TO BE HELD JULY 9-13

The 25th National Housewares Manufacturers Exhibit will be held July 9-13 in Atlantic City, N.J., according to Dolph Zapfel, secretary, National Housewares Manufacturers Association.

A total of 575 exhibitors will occupy the Atlantic City Auditorium, and an estimated 10,000 housewares buyers from the U. S. and Canada are expected to attend.

### KELVINATOR SALES UP

For the twelfth month in a row, Kelvinator sales have surpassed totals for the same month a year ago, Walter Jeffrey, vice president in charge of sales, Kelvinator Div., American Motors Corp., Detroit, announced.

### TOASTMASTER GOLD TOASTER

Toastmaster had introduced a 24-carat gold-plated toaster to mark the 30th anniversary of the automatic pop-up toaster. A copper toaster has also been unveiled by Toastmaster Products Div. of McGraw Electric Co., Elgin, Ill.

### TEMCO ASST. PLANT MGR.

Thomas L. Norton has been promoted to assistant plant manager at the Garland, Texas, plant of Temco Aircraft Corp., announced plant manager W. A. Tweedie.

to Page 72 →



## FORD MOTOR COMPANY Paints a Rainbow...

A new technique in spraying developed by the Ford Motor Company results in exciting rainbow pastels . . . plus new speed in paint application . . . faster color changeover . . . and superb quality of finish . . . all without sacrificing production time.

DESPATCH built and installed the Down Draft Spray Booth shown above in Ford's Dearborn plant. Wealth of production experience assures the highest standard of performance from DESPATCH equipment. There's a DESPATCH-trained resident engineer near you. Why not talk to him about your finishing requirements?



Photo of interior of DESPATCH spray booth shows down draft air flow. Notice the wide working area around the production line plus unique arrangement of pipe lines, spray hoses.



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Bulletin 51

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PIONEERS IN ENGINEERING FINISHING SYSTEMS FOR INDUSTRY



## NEWS

→ from Page 70

### TERRY TO G-E COMPONENT PRODUCTS DIVISION

J. H. Terry, formerly located at Hotpoint Co., Milwaukee, has been transferred to the General Electric Component Products Div. at Fort Wayne, Ind. He will be working in development applications of ceramic materials in his new position.

### OIL BURNER SALES UP 10%

The Plumbing and Heating Industries Bureau has announced that sales of oil burners during 1955 were 10% above 1954.

### UNIVERSAL JAN. SALES UP

Electric housewares sales for January were "about 50%" ahead of 1955, H. S. Perkins, division sales manager of Landers, Fray & Clark, New Britain, Conn., announced.

### MCGRAW BUYS W. E. MOORE

It is reported that McGraw Electric Co., Chicago, has acquired the principal assets of W. E. Moore & Co., Pittsburgh.

## ELECTRICAL ENGINEERS MEET

The Fort Wayne Section of the American Institute of Electrical Engineers announces that the Great Lakes District meeting will be held at Fort Wayne, Ind. on April 16-18. The theme will be

"Engineering Futures Unlimited." Technical papers will be submitted on the following topics: stationary electrical equipment; magnet wire; small motors; electronics; power generation and distribution; and engineering education.



**Special recognition certificates**—for outstanding work in the area of cost reduction during 1955 were presented to the supervisors pictured here at a dinner attended by supervisors of the manufacturing division of The Maytag Co. The certificates were presented by George M. Umbreit, executive vice president and treasurer.



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## Market facts Bulletin NO. 4

FERRO CORPORATION • CLEVELAND 5, OHIO

### Dealers rate Porcelain Enamel high as exterior finish for **REFRIGERATORS!**

Independent surveys among 6,000 representative appliance dealers show Porcelain enamel constantly winning new friends—particularly for such uses as refrigerator exteriors. For instance:

**Question:** "Which of these types of finish do you consider best for the outside of Refrigerators?"

**Answers:** While 53.0% voted for the type of finish now generally used, **37.9% voted for Porcelain enamel . . .** and 2.9% expressed no opinion.

**For refrigerator interiors, as might be expected, Porcelain enamel is a 13 to 1 favorite.**

**Question:** "Which of these types of finish do you consider best for the inside of a Refrigerator?"

**Answers:** **82.6% voted for Porcelain enamel**, 6.4% for the second-choice material, with 2.1% expressing no opinion.

HOW DEALERS VOTED ON PRINCIPAL ADVANTAGES OF MATERIALS AND FINISHES

	Material "A"	Material "B"	Finish "C"	Finish "D"	Porcelain Enamel
Total Respondents—1,663					
Appearance from Sales Viewpoint	83	348	130	436	1,096
Sanitation and Ease of Cleaning	81	487	101	241	1,295
Resistance to Wear	136	737	71	112	973
Resistance to Rust and Corrosion	384	763	79	108	972
Resistance to Soaps and Alkalies	77	549	60	83	1,182
Resistance to Heat	159	572	59	98	907
Permanence of Finish	151	800	62	141	1,091
Total Number of Mentions	1,071	4,156	562	1,219	7,516
Number of Respondents Responsible for Mentions	507	1,040	245	570	1,489

**PORCELAIN ENAMEL** stays white for life!



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*Colors* TOO

Appliances finished in colored Porcelain Enamel have the same advantages as those finished in white... the same hard, glass-like surface that resists all forms of wear and scratching; the same rock-like composition that is proof against staining; the same high-temperature fusing that locks-in the qualities that make Porcelain Enamel supreme in appliance finishes.



THIS LABEL identifies products finished in genuine Porcelain Enamel. Be sure to use it wherever you can. It has strong point-of-sale appeal.

Appliance manufacturers who use Porcelain Enamel offer prospective customers the one appliance finish that won't discolor or fade with age—the non-yellowing finish that keeps its original beauty and charm for life! Whether it is the ever-popular white, or a lovely new decorator's color, Porcelain Enamel is the one finish that is not scratched by skillets or knives, is not stained by juices, is not harmed by heat.

Use these outstanding advantages to gain quick acceptance of your appliances!

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## NEWS

→ from Page 72

### METHODS IMPROVEMENT CONTEST

The Industrial Management Society has announced it is accepting entries for its Fifth Annual Methods Improvement Contest to be held in conjunction with its 20th Anniversary Time and Motion Study and Management Clinic, October 31-November 2 at the Hotel Sherman, Chicago.

Rules and regulations for the contest may be obtained by writing to the Industrial Management Society, 35 East Wacker Drive, Chicago 1.

### WESTON HEADS HOTPOINT'S NEW TV DEPARTMENT

D. Edward Weston, Jr., has been named general manager of the new television receiver department of Hotpoint Co., Chicago.

### NEMA NOVEMBER FIGURES

The National Electrical Manufacturers Association has announced the follow-

ing sales figures for November 1955: electric ranges, 86,429; electric household refrigerators, 217,364; electric storage water heaters, 36,140; and electric farm and home freezers, 42,074.

### PHILCO NAMES HOUTZ

Robert A. Houtz has been named sales manager of builder sales for Philco Corp.'s Appliance Div., announced R. A. Rich, vice president and general manager.

### BENGAL AIMS FOR 50% SALES INCREASE IN '56

With 1955 sales up 50% over 1954, the Bengal Range Div., John Wood Co., is looking for a 50% increase in 1956, W. Frank Fisher, vice president of John Wood Co. and Bengal general manager, announced.

### AMANA APPOINTS NOLL

Francis A. Noll has been appointed chief cabinet engineer of Amana Refrigeration, Inc., it was announced by Robert E. Moore, director of engineering.

### STEEL KITCHEN CABINET MANUFACTURERS MEET



Included among speakers at the Steel Kitchen Cabinet Manufacturers Assn. architectural-builder forum in New York on February 9 were, left to right, E. E. Bang, Republic Steel Kitchens; E. J. Catlin, Morton Mfg. Co., chairman of the sales promotion committee; panel moderator, John Normile, Better Homes and Gardens; C. A. Reinbolt, Jr., Tracy Kitchens; Joseph B. Mason, American Builder; and Mary Kraft, Good Housekeeping.

Plans for the third annual promotion of Steel Kitchen Cabinet Month in September were reviewed by members of the Steel Kitchen Cabinet Manufacturers Association at their quarterly meeting in New York on February 10.

A special sub-committee under the direction of Norman Lea, sales manager for Geneva Kitchens, showed the special promotion package and display pieces developed for use by dealers during September.

George Shenk, U. S. Steel Co., ex-

plained plans for U. S. Steel's spring promotion called "Kitchen Call", and promotional plans for Operation Home Improvement were presented by Don Moore.

Featured luncheon speaker was Laurence Wray, editor of *Electrical Merchandising*, whose topic was "The Dealer in The Kitchen Business".

The next meeting of the Association will be held June 1-3 at The Greenbrier, White Sulphur Springs, W. Va.

## OPENINGS

at

# CROSLEY AND BENDIX

CROSLEY Electric Ranges, Freezers, Air Conditioners and Refrigerators are famous the world over. So is the BENDIX Duomatic all-in-one washer-dryer. The Engineers we prefer should have 1 to 3 years' experience in the appliance or associated fields. They will work directly with the Project Engineer and have important responsibilities in the following areas:

1. Design and development of new products and components.
2. Practical and functional applications of new and present products and their components.

Our advanced-development programs call for Senior Engineers who have vision and ability. Salaries are in keeping with the positions.

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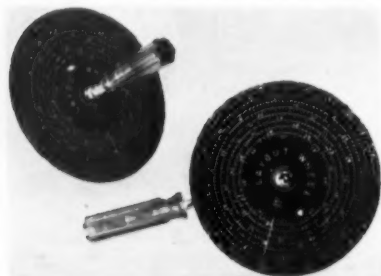
# New Supplies and Equipment

## D-10. Bronze decorative plate for steel and zinc die castings

**New** A bright bronze decorative plate of about 90% copper and 10% tin can be used instead of copper and/or bright-nickel plate to protect steel and zinc die castings from corrosion. It is plated directly with chromium, by using the conventional bath for chromium plating, or is directly plated with bright nickel and chromium without the necessity for buffing. The plate is mirrorlike. For color plating the true red-bronze appearance can be preserved by lacquering. It is said to have excellent throwing power, making it especially useful for uniform plating of complex-shaped parts.

## D-11. Layout wheel

**New** A layout wheel provides both a measuring wheel and a conversion chart on the face of the wheel for quickly converting from diameter to circumference or from circumference



to diameter. The wheel is calibrated in inches around its circumference. Also, the wheel contains a number of concentric circles which are graduate in diameter figures.

## D-12. Free machining steel bar

**New** A new, high strength, free machining steel bar which requires no heat treating has been announced. The new product, introduced under the trade name "Fatigue Proof", has in-the-bar properties usually associated only with heat treated steels — plus greatly improved machinability. It also helps to drastically cut part costs, according to the manufacturer.

## More Information

For more information on new supplies, equipment and literature reviewed here, fill out the order form or write to us on your company stationery.

## D-13. Five speed gear reduction unit

**New** A five speed gear reduction unit has been developed. Speeds can be changed quickly (while



the unit is running) by turning a dial; the unit has the following gear reductions 2 1/2, 5, 10, 25 and 50 to 1. To eliminate the cost of a clutch and dismounting the unit for special setup, there is a neutral station. Housing is cast of aluminum, shafts and precision

gears are 416 S.S. Input and output shafts are both mounted in ball bearings. Overall height is 3", overall length, 3 7/8". Base is designed with "T" slots and captive nuts to simplify mounting and meshing the output gear with your drive unit. Two models are available.

## D-15. Lightweight motor for oil burners

**New** A new lightweight motor for oil burners has been introduced. Rated 1/4 hp, the new unit is specifically designed for heavy duty



service in oil burners used in industrial plants, institutions, etc.

## D-14. Automatic hardness tester

**New** The fully automatic hardness tester is equipped with vibratory feed. The device is capable of testing the hardness of ferrous and non-ferrous metals at the rate of approximately 1,000 parts per hour. The parts, after testing, are routed into bins which are labeled Hard Good and Soft. Colored lights mounted above the dial show the classification of each part as it is being tested, giving a visual indication of quality control to production operators and supervisors.





## Industrial Literature

### 410. "Why Hot Spray?"

**New** This booklet describes the Circaflo Special hot spray unit which features a quick change color selector system. A new design selector valve is combined with the heater to offer the advantages of hot spray for the installation which requires frequent color changes, as well as for the continuous duty single color operation. Because clean-out and color change take less than a minute, the Circaflo Special will serve where a separate heater would otherwise be required for each color.

### 411. Test equipment for major appliances

**New** A new catalog bulletin includes a comprehensive multi-page presentation of specialized equipment for use in the field service of major appliances. The literature contains photographs of the required instruments with specifications and information concerning proper usage of the test equipment.

### 412. Booklet on adhesives

**New** A new 12-page, two-color highly illustrated catalog listing properties and applications of a wide variety of adhesives, coatings and sealers is available. Typical applications of adhesives, coatings and sealers in the metalworking, general manufacturing and building products industries are listed in comprehensive tables.

### 413. Phosphating material

**New** A new phosphating material known as "Metacote" is discussed in a 4-page booklet. According to the manufacturer, it is adaptable to both spray washer and immersion tank processes and creates a fine, even, tightly adherent coating which assures exceptionally good paint adhesion and salt spray resistance. It is non-sludging type material and may be used in mild steel equipment. Although it is normally used for treating steel, it is also effective on aluminum and zinc die cast metals.

An outstanding characteristic claimed for Metacote is that no special additive or secondary material is required in order to produce consistently good results.

### 414. Booklet on metal nameplates

**New** A booklet which illustrates and describes metal nameplates is available. The nameplates require no screws, rivets, etc., and no drilling is necessary for application.



The background is in metallic high-gloss red; wording in silver; and AGA star, blue.

They adhere to any smooth, cohesive surface and are government approved. They will not crack, peel or tarnish and are available in several colors or aluminum and in almost every size and shape. Sample nameplates are included with the booklet.

### 415. Catalog on fans

**New** Just published is a catalog covering Class III fans, especially designed for high velocity air conditioning systems. The fans are also suited for industrial use.

### 416. Conveyor belt catalog

**New** A complete line of stitched canvas conveyor belts is described in a new illustrated catalog. Facts on the selection and specification of stitched canvas belts are given as well as details of belt construction, impregnation and curing. Recommendations for all types of conveying are included.

### 417. Glass fiber products

**New** A new catalog describes and illustrates uses of Microlite and Super Fine blanket insulations for thermal and acoustical treatments. In addition, it has references to Microflex compressed board, a resilient cushion material, quartz and glass Micro-Fibers and reinforcements for plastics.

### 418. 66-page metalworking catalog

**New** Most effective cutting speeds for carbide tools, machine tool horsepower requirements, how to determine shank size of single-point tools, carbide tool geometries, carbide grade selection and other technical topics are covered in a new 66-page metalworking catalog. The new 2-color publication also includes price and specification information on standard brazed carbide tools, tool holders, standard carbide throw away inserts, blanks for twist drills, dies, bushings, guide rings, balls, valve seats and many other applications.

**FINISH**  
York Street at Park Avenue  
Elmhurst, Illinois

Please forward to me at once information on the new supplies and equipment and new industrial literature as enumerated below:

No. \_\_\_\_\_ No. \_\_\_\_\_ No. \_\_\_\_\_ No. \_\_\_\_\_

No. \_\_\_\_\_ No. \_\_\_\_\_ No. \_\_\_\_\_ No. \_\_\_\_\_

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Company Address \_\_\_\_\_

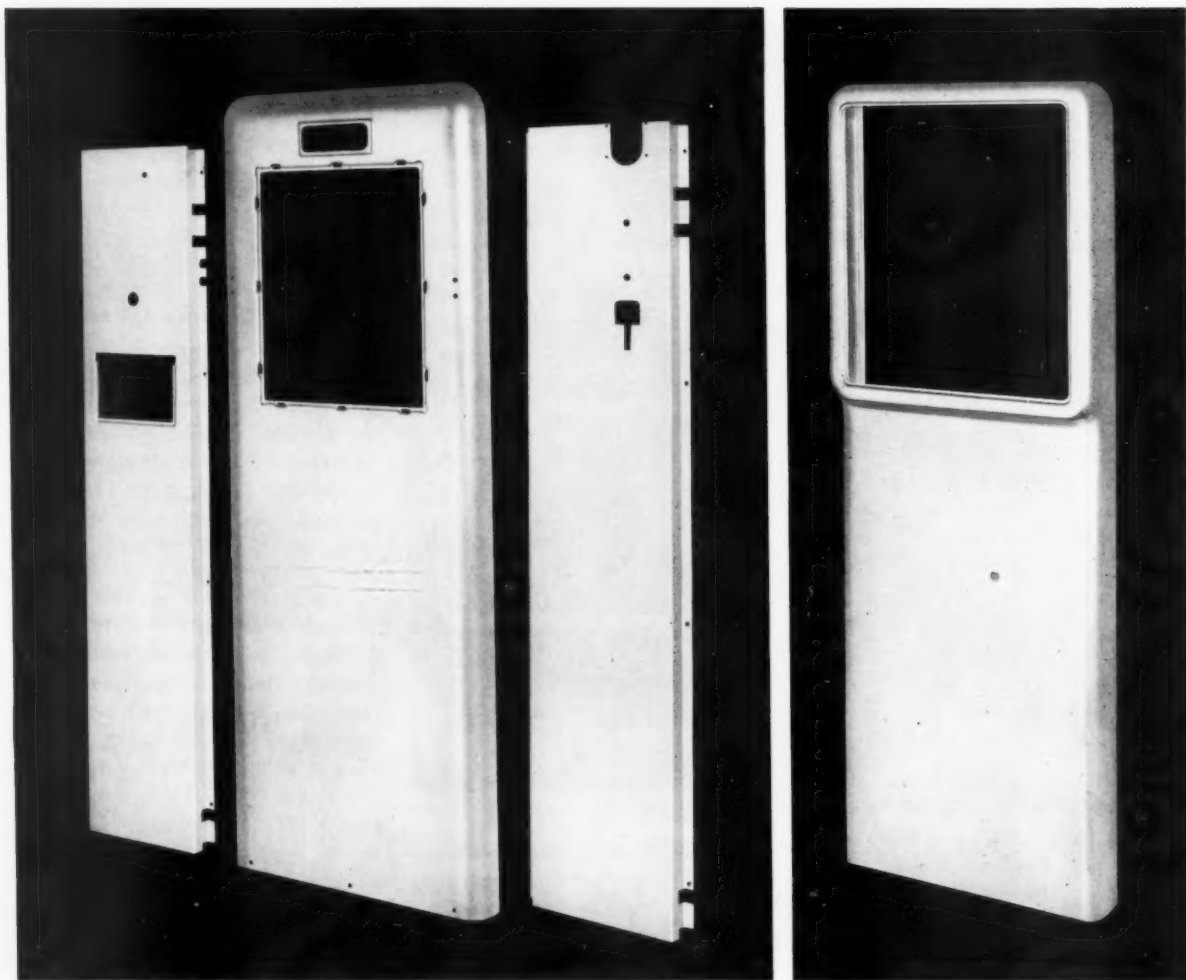
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Immediately above—2 side and front panels of recently produced gasoline dispensing pumping cabinet. Front panel is 20½" x 54", side panels 11½" x 50". At right is the front panel of another type cabinet produced at our plant, size 20½" x 54".



You get Quality stampings at reasonable prices because:

We analyze the stamping you want—

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We rearrange our press equipment to set up the most economical production line.

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**YOUNGSTOWN METAL PRODUCTS COMPANY**

Youngstown 1, Ohio

# NEWS about Suppliers

## FOLLANSBEE KEY APPTS.

Louis Berkman, president, Follansbee Steel Corp., has announced the appointments of Irving J. Berkman as executive vice president and Dewey O. Olson as vice president in charge of mill operations.

## CHICAGO VIT NAMES JOHNSON DIRECTOR OF NEW LAB. DIV.

W. Hogenson, president, Chicago Vitreous Corp., Cicero, Ill., has announced the appointment of L. A. Johnson as director of a new development laboratory.

Johnson was formerly assistant service manager.

## TUTTLE & KIFT APPT.

E. G. Weissenberger, formerly sales manager, has been named manager of special and industrial heating units and devices, announced Tuttle & Kift, Inc., Batavia, Ill.

## VITRO CORP. ELECTS JEWETT VICE PRESIDENT & DIRECTOR

Frank B. Jewett, Jr., has been elected a vice president of Vitro Corp. of America and a member of the board of directors, according to J. Carlton Ward, Jr., president.

Jewett was formerly with the Mechanical Div. of General Mills, Inc., as managing director of engineering research and development.

## BLACK TO HEAD ORGANIC SALES FOR COWLES CHEMICAL

Frank F. Black, for 20 years associated with the organic chemical trade, has joined the sales staff of Cowles Chemical Co., Cleveland. He has been named manager of the newly established organic chemical department, announced C. C. Bassett, vice president and director of sales.

## JACKSON, WEHRLI HEAD ROBERTSHAW-FULTON DIVISIONS

Thomas T. Arden, executive vice president, Robertshaw-Fulton Controls Co., has announced the appointments of Wilbur Jackson and Robert L. Wehrli.

Jackson, a vice president, has been named general manager of the Grayson

Controls Div., Long Beach, Calif. Wehrli, formerly director of research and development, has been appointed general manager of the Aeronautical Div., Anaheim, Calif.

## EMBERSON INTERESTS BUY CENTURY VIT FROM THOR

A father and son team consisting of H. C. Emberson and two sons have purchased Century Vitreous Enamel Co. from Thor Corp.

The new president of Century Vitreous was formerly vice president and director of Diamond T Motor Car Co. He was vice president of the Chicago Purchasing Agents Association for 3 years. Bob Emberson formerly operated his own business as a manufacturers' agent in Milwaukee, and Dick Emberson was formerly an industrial engineer with U.S. Steel.

According to a statement to finish from these executives, the technical and manufacturing organization will remain intact. Officers and key personnel of the company are H. C. Emberson, president; R. E. Emberson, vice president in charge of sales; C. R. Emberson, secretary and treasurer; R. L. Fellows, vice president in charge of Frit Div.; George Sirovy, technical consultant; and Harry Sirovy and Ferd Rozene, sales and service.

## MERCER RETIRES AS ARMCO ADVERTISING MANAGER

R. A. Dadisman, manager, market development division, Armco Steel Corp., Middletown, Ohio, has announced the retirement of H. V. Mercer as advertising manager after 40 years with the company. Succeeding Mercer



PAUL LANG



R. H. TURK III

is Rae K. Leedom, former supervisor of Armco Drainage & Metal Products, Inc. advertising copy.

## FAHRALLOY PROMOTES LANG

Paul Lang has been promoted to sales engineer by The Fahrallloy Co., Harvey, Ill., according to Robert E. Kroc, sales manager. Lang will cover the Midwest area.

## RICHARD TURK III NAMED PEMCO WORKS MANAGER

Richard H. Turk, III, has been appointed works manager for Pemco Corp., Baltimore, Md., according to Karl Turk, vice president. Richard Turk was assistant works manager prior to this appointment.

## BOHN ALUMINUM BUYS BETZ

Bohn Aluminum & Brass Corp., Detroit, announces that it has acquired the assets of Betz Corp., Hammond, Ind.

Bohn president S. E. Den Uyl said the move is part of a company plan of expansion and diversification. The new facility will be operated as a Bohn division.

## OGBURN RETIRES AS FOOTE VP

Dr. S. C. Ogburn, Jr., retired as of March 1 as vice president—research and development for Foote Mineral Co., Philadelphia.

to Page 80 →

**"Clawson Sales Management Award"** — for outstanding sales management achievements is presented to Gerry Johnson, district sales manager, frit and glaze division, Ferro Corp., Cleveland, by C. D. Clawson, president.



**One Millionth clamp-down frame**—has been manufactured by Vance Industries, Inc. Pictured are, front row, left to right, Lily Thurber, Celia Sleeper, Ray Wallace, controller, Charles Strahs, plant superintendent, Martha McMahon, Peter L. Siewert and Al Krane, sales representative. Rear, left to right, Roy Colt, executive vice president, and Charles Pintard, assistant purchasing agent.



### DEVENS TO MISS. ALUMINUM

H. F. Devens has been appointed manager of the Mississippi Aluminum Corp., Gulfport, Miss., according to J. E. Williams, vice president for operations, Metals Div., Olin Mathieson Chemical Corp., N.Y. Mississippi Aluminum is a subsidiary of Olin Mathieson.

Devens was formerly sales manager of Olin Roll Bond products and will be succeeded in that capacity by U. R. Jaeger, announced D. T. Marvel, vice president for sales, Metals Div.

### PALNUT MOVES TO NEW PLANT

The Palnut Co. has moved to a new plant in Mountainside, N.J., doubling the capacity of the plant facilities formerly occupied in Irvington, N.J.

### PORCELAIN ENAMELS FOR LIGHT GAUGE METALS

Porcelain enamel finishes for products manufactured of light gauge metals are being produced by Pemco Corp., Baltimore, Md. The new low-temperature enamels can be fused to the metal at temperatures from 1250-1300°F.

The low temperature porcelain enamels are suggested for architectural pan-

els, air conditioning units, refrigerator exteriors, clothes dryers, kitchen cabinets, etc.

Pemco points to 2,500,000 homes with window air conditioners and a 43,000,000 potential, considered to be an A-1 use for the new finishes.

### TITCHENER SALES APPOINTMENT

Charles S. Bishara has joined E. H. Titchener & Co., Binghamton, N.Y., as assistant to the sales manager. Bishara will specialize in sales promotion and advertising, announced President Paul F. Titchener.

### LOUTHAN EXPANSION PROGRAM

An expansion program consisting of a new 40 foot diameter circular kiln and 12,000 additional feet for storage has been announced by C. W. Gerster, executive vice president, Louthan Mfg., subsidiary of Ferro Corp.

### SELAS CORP. MOVES

As part of an expansion and modernization program, Selas Corp. of America has announced a move from its Philadelphia site to a new million-dollar plant in Dresher, Pa.

### BINKS SPRING SCHOOL OF SPRAY PAINTING

Applications are being taken for the Spring Session of the Binks Mfg. Co.'s free School of Spray Painting.

The school will be held on April 2-6; May 7-11 and June 4-8. Applications for registration may be obtained by writing to Binks Mfg. Co., 3132 Carroll Ave., Chicago 12.

### NEW REDMOND PLANT

A new plant in Angola, Ind., is being completed by The Redmond Co., Inc., according to James W. Tweedy, president.

### NORWEB IS ENAMEL PRODUCTS GENERAL MANAGER

R. Henry Norweb, Jr., has been appointed general manager of The Enamel Products Co., Cleveland, George C. Johnson, Jr., president, announced. A vice president since March, 1955, Norweb formerly was in charge of operations.

### AMERICAN EMBLEM APPT.

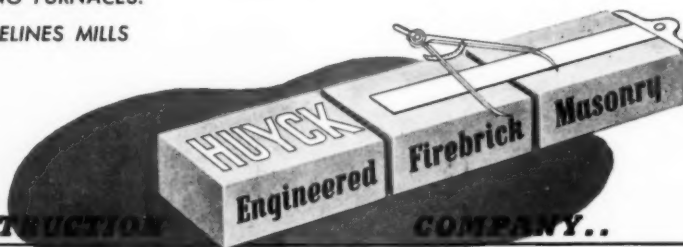
The American Emblem Co. has announced the assignment of Edward J. Urban as district manager at the Chicago office. He will represent the company in the Central States.

### INLAND STEEL ESTABLISHES 22 SCHOLARSHIPS

Inland Steel Co., Chicago, has announced the establishment of 22 scholarships at 15 colleges and universities. Selection of the scholars and administration of the scholarships will be left to the schools. Nine scholarships are for study in the field of liberal arts and sciences, and the balance are in engineering.

**HUYCK FURNISHES FIREBRICK MASONRY TO BUILD, REBUILD AND REPAIR ALL TYPES OF: ENAMELING FURNACES . . . FRIT SMELTERS . . . ALUMINUM, BRASS, LEAD SMELTERS . . . FORGE FURNACES . . . HEAT TREATING FURNACES.**

**HUYCK LINES AND RELINES MILLS**

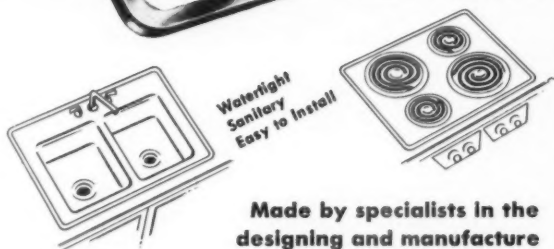
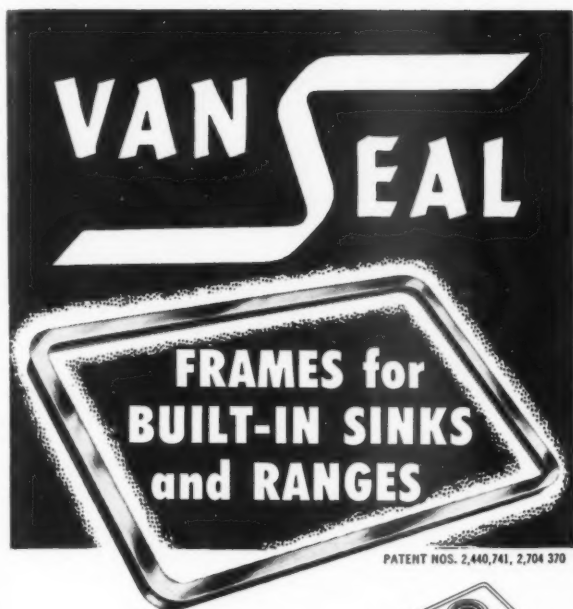


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**Huyck CONSTRUCTION COMPANY..**

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**YOU CAN  
DEPEND  
ON THESE  
FEATURES**

**PERFECT BENDS—  
EVERY TIME**

Each corner radius is exact, assuring a tailor-made fit.

**LEGS ARE ALWAYS  
VERTICAL—STRAIGHT**

The vertical leg of every VanSeal Frame is at a perfect 90° angle to the top flange to assure a tightly-sealed installation.

**EXACT UNIFORMITY**

VanSeal Frames of the same size are consistently alike in their measurements.

**INVISIBLE WELDS**

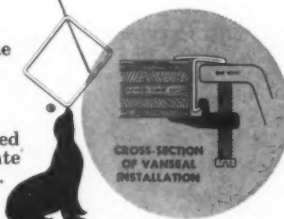
Welded so perfectly—finished so smoothly—you can't locate the weld on the top surface.

Vance has pioneered in the manufacture of stainless steel clamp-down frames and has already produced more than a million!

When you use VanSeal Frames on your built-in sinks and ranges, you can be sure of a frame that will fit perfectly! Installations can be made with confidence.

VanSeal Frames assure easy, sanitary, self-aligning installation and added beauty for your counter-top and built-in range units. Benefit from Vance Industries' long experience in making frames for all types of built-in units.

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**THIS NEW 8-PAGE  
FOLDER ON *Peerless* FORMED  
WIRE PRODUCT FABRICATION**

This new 8-page brochure shows the plant facilities for fabrication of Peerless' formed wire products . . . from wire storage room through shipping . . . from the simple forming operations through the most complex welding and assembly.

Peerless has been one of the foremost formed wire product fabricators since 1910. There's plenty to learn about Peerless' formed wire product fabrication from this booklet and . . . it's yours for the asking. Write today!

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**PEERLESS WIRE GOODS COMPANY, Inc.**  
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**CASTER SOCKETS  
AND BRACKETS  
...OUR SPECIALTY...**

Here are a few of the types of caster sockets and brackets manufactured by Danielson. All are produced with extreme economy to exact specifications. Let us figure on your needs.



Our plant is specially geared for this type of work where high production and low cost are a prime factor . . . . and yet quality and precision workmanship are always our goal.

Our Press Department is equipped with presses ranging from 5 ton to 300 ton capacity, and specializing in deep draw work for Appliance and other Metal Products Manufacturers. Other services include: Shearing — Circle Shear — Spot Welding — Arc Welding — Silver Soldering — Hydrogen Brazing — Polishing — Degreasing — Painting — Assembly — and our complete Tool and Die Department will furnish precision tooling for your own fabricating department.



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Write, phone, or wire, today!

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**Danielson**

your stamping headquarters

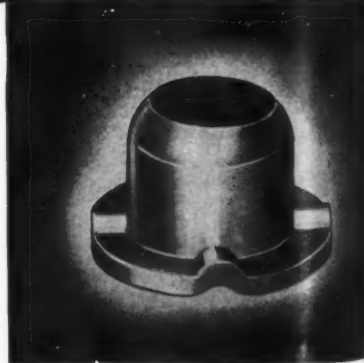
for **PRECISION**

**WASH MACHINE**

**PARTS . . . . .**

Danielson stamped **WELD NUTS** for use on automatic washing machines, dryers, refrigerators and other similar products requiring leveling at point of installation.

Danielson **WELD NUTS** made in a multi-sequence stamping process are equal in durability and strength to any machined weld nut but cost less.



Typical American differences of opinion

### which way enameling iron?

In the February issue, a *finish* reporter quoted a prominent steel company executive as expressing the viewpoint that, with new improvements coming along in finishes, cold rolled steel may prove to be entirely adequate for future use and that enameling iron may not be needed.

In contrast to this, we see a report that U.S. Steel Corp. has awarded a contract for a new continuous normalizing line to process vitreous enameling sheets at the rate of approximately 15 tons per hour and the equipment is scheduled for installation at U.S.S. Irvin Works.

### Westinghouse

→ from Page 54

exterior defects can be quickly and readily seen. Color match also must be checked to assure uniformity of color on all component parts of the machine as well as with a standard for other Westinghouse major appliances. After final "O.K." a serial plate is attached. This signifies the machine is ready for shipping.

The Wash-N-Dry Laundromat will next travel to the crating floor where, after handing the machine to the crate bottom, it is enclosed in a cleated corrugated container. An elevator is used for transfer to the warehouse, either for storage or direct loading into box cars for shipment.

Samples are taken, from the machines which are crated and on their way to the warehouse, for Safe Transit testing. At this point these machines (selected at random — a minimum of one per shift) are subjected to the vibration and incline-impact tests as outlined in the National Safe Transit Program. This is a quality control, for the original design of the product and the container have been Safe Transit tested as a packaged product and approved for application of the Safe Transit shipping labels.

When the shipping crate is removed following the testing, the washer-dryer must be undamaged. The washer-dryer

will be examined for loose bolts, broken connections, misalignment of parts, or any other defect which could be produced by rough handling in shipping.

After the transportation check, some of the machines are run for life check on all component parts. Actual clothing loads are washed over and over in performance checks and as a final quality control measure.

### Multicolor paint offers new opportunity for finishes

Multi-colors, depending upon the angle of vision, from the same lacquer coat, have been announced recently by the du Pont de Nemours & Co. Product testing is now underway, whereby metallic powders are added to their

acrylic-monomer lacquer, causing the finished surface to "flop" colors. This effect, said one spokesman, causes a surface to change shade with the angle of inspection. "You can see anything from a deep purple to a pastel green when bronze powder is added to the paint," he said. Problems of manufacture have been licked, the company has announced and final development is "a matter of months."

"Flop" colors from automobiles to room air conditioners or small appliances offer unique possibilities to be explored, *finish* editors point out. Tomorrow's question as to "What color is your porch furniture?" might well invoke an answer "It depends where you're standing."



you won't  
crack,  
chip,  
or peel  
the  
**Ty-Bond**  
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phosphate  
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**Hand in Hand**

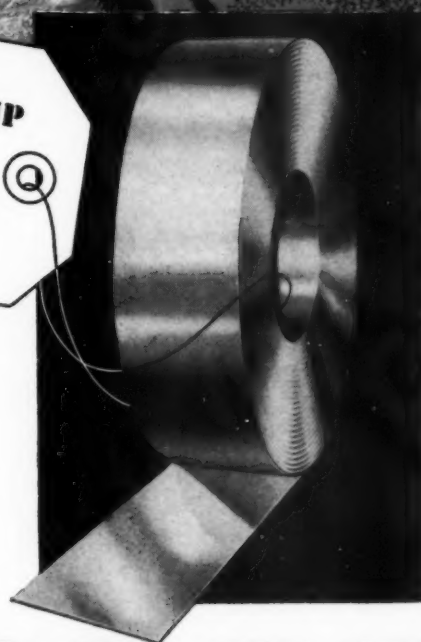
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**QUALITY**

**COLD ROLLED STRIP**  
by  
**FOLLANSBEE**

Pride in product is perhaps the strongest reason for Follansbee's reputation in the industry as, "A Quality Producer of Cold Rolled Strip." And Follansbee mill operators are not satisfied until every specification on every order is met *exactly*.

Why not add your name to our growing list of satisfied users. A Follansbee representative is always near at hand and anxious to prove what true quality and unmatched service can do for you and your product.




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## **STEEL CORPORATION**



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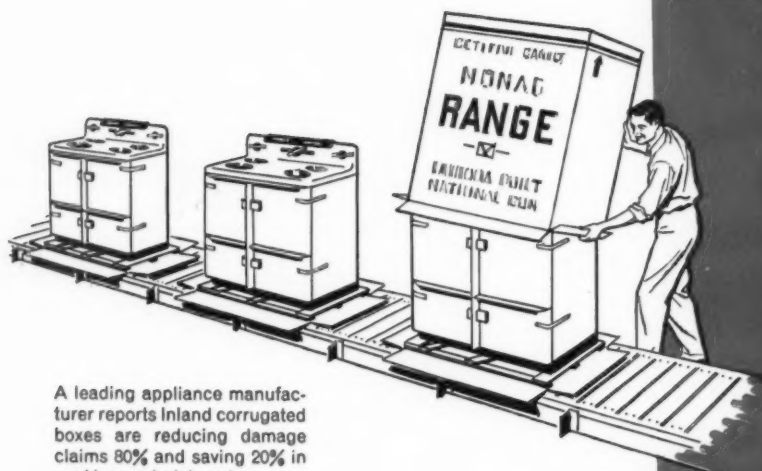


*April • 1956*

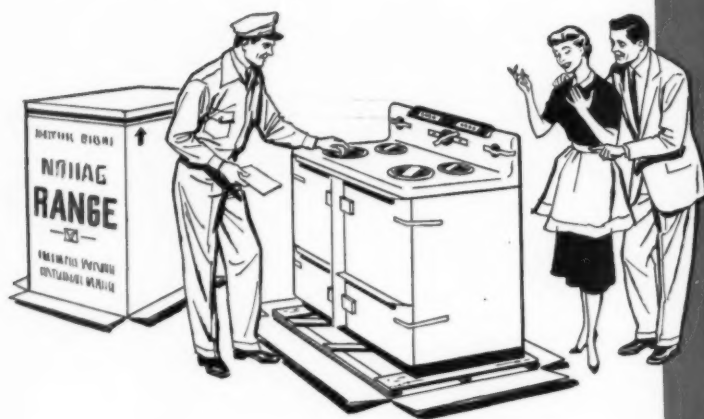
# sale transit

**FROM ASSEMBLY LINE TO FINAL CUSTOMER**

## MODERN APPLIANCES "GO" CORRUGATED...



A leading appliance manufacturer reports Inland corrugated boxes are reducing damage claims 80% and saving 20% in packing material costs.



Inland  
Boxes  
Build  
Good  
Will

● For thirty years Inland corrugated shipping containers have been saving time, labor, and shipping costs for Inland customers. They *protect* thousands of leading American products and also *promote their sale*. "Inland boxes build good will"—all the way from packing line to ultimate consumer.

Take Advantage of Latest Packaging Know-How...

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# safe transit

April, 1956

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## editorial voice of the national safe transit program

devoted to improving packaging methods and shipping and materials handling methods for the appliance and metal products manufacturing industries. This section contains plant experience information and industry advances for the use of all executives and plant men interested in improving packaging and shipping methods and in loss prevention. The section contains complete information on the national safe transit pre-shipment testing program for packaged finished products and detailed reports of divisions and sub-committees of the National Safe Transit Committee.

published monthly as special section of finish — the magazine of appliance and metal products manufacturing

## Safe transit program gets industry promotion to trucking industry

Freight claim section of ATA will use posters—presentation kits—to acquaint trucking employees with NST program.

Many thousands of trucking employees, located at trucking terminals throughout the country, will hear the Safe Transit pre-shipment testing story featured during the next few months. The program to acquaint trucking management and handling personnel with the Safe Transit label and the program it represents is an integral part of the new "Claim Cutter" Campaign launched this month by the Freight Claim Section of American Trucking Associations, Inc.

ATA's new loss and damage prevention program is built around a presentation unit and a series of poster units.

The presentation unit consists of six front sheets which face the listeners during the presentation, and serve as visual aids for short, powerfully worded talks on the basic elements of loss and damage prevention.

ATA has produced hundreds of these presentation and poster units for the trucking industry's use at all trucking terminals. Working in close cooperation with the National Safe Transit Committee, ATA's Freight Claim Section, headed by John M. Miller, executive secretary, devotes one of the seven front sheets to a reproduction of the Safe Transit label.

### SHIPPERS USING -

this label are  
investing time  
and money in

### PRE-SHIPMENT TESTING

to assure  
safe delivery of  
their products

They are helping us  
cut claims

SO ---

let's make this label  
a reminder to give  
their shipments  
—and all shipments—

CAREFUL  
HANDLING!



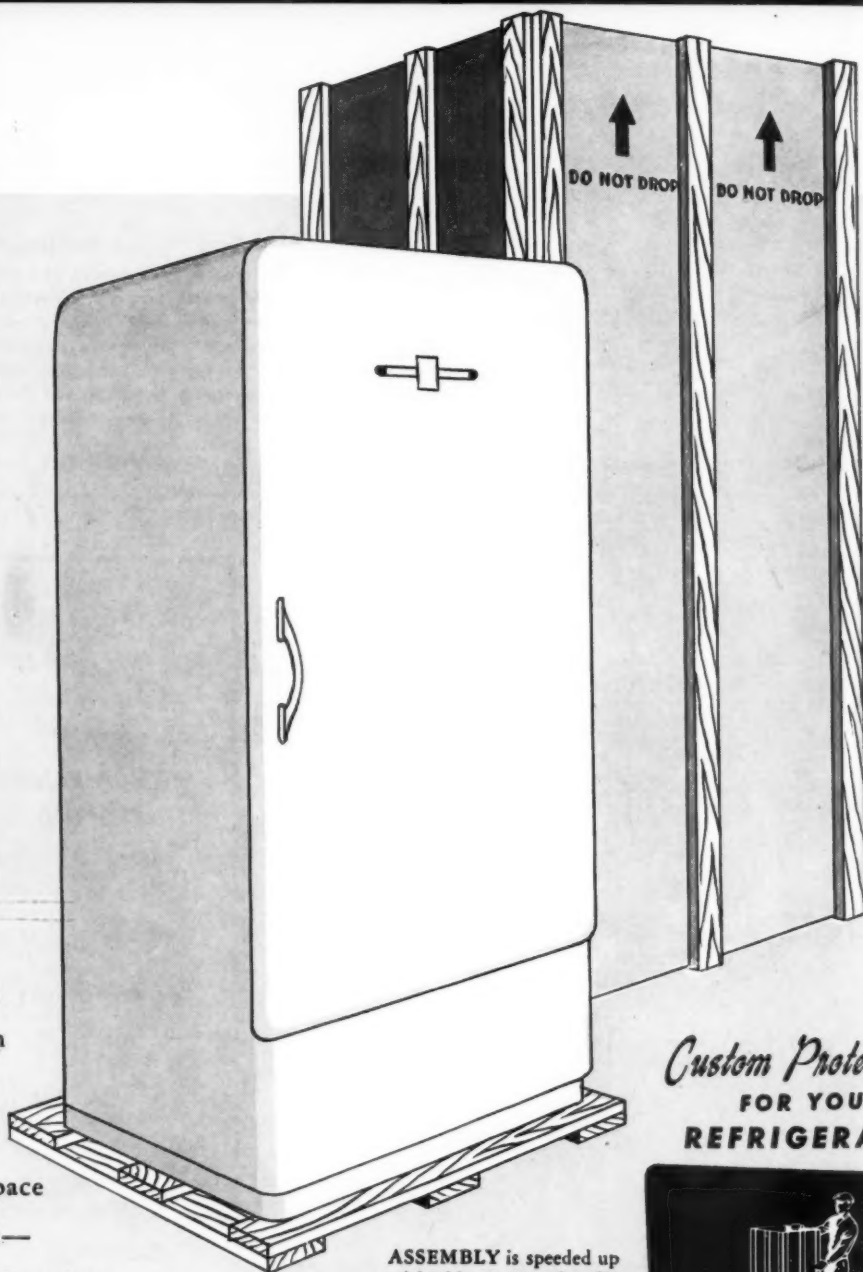
As handling personnel view the Safe Transit front sheet, the person conducting the presentation reads the following short talk printed on the back: "This matter of freight loss and damage is vitally important to America's leading shippers . . . so important that many of them joined together to develop the National Safe Transit Program to combat it.

"These companies are putting their packaged products through pre-shipment tests that duplicate actual transit and handling conditions. When shipments pass these Safe Transit tests, the manufacturer knows

# WATKINS has the container for your shipping problem

Watkins Containers provide—stacking strength—ease of assembly—minimum shipping weight, thus reduced shipping costs—smooth staple-free interiors—easy handling—minimum of storage space needed—protection from dust and dirt—resistance to “weaving” and shock—“Traveling Billboard” feature for product identification and advertising.

For home appliances, for *all* types of finished products, the Watkins Container is your best insurance for safe delivery. Ship your carefully manufactured products safely and economically—ship them the “Watkins Way.”



ASSEMBLY is speeded up with this easy-to-handle container. The assembly crews are all for packing the Watkins Way.

*Custom Protection*  
FOR YOUR  
REFRIGERATOR



these companies build WATKINS containers

Cozier Container Corp. .... 446 East 131st Street, Cleveland, Ohio  
Crate-Rite Mfg. Co. .... 4079 Halleck Street, Oakland 8, California  
Dura-Crates, Inc. .... 940 East Michigan Street, Indianapolis, Indiana  
General Box Co. .... 1825 Miner St., Des Plaines, Illinois and  
16th and Maple Sts., Louisville, Kentucky  
Hemb & Martin Mfg. Co. .... P. O. Box 108, Murfreesboro, Tennessee  
Illinois Box & Crate Co. .... 811 Center Street, Plainfield, Illinois

Kieckhefer Box & Lumber Co. .... 1711 West Canal Street, Milwaukee, Wis.  
Lane Container Corp. .... 10212 Denton Road, Dallas, Texas  
Lewisburg Container Co. .... 243 Singer Street, Lewisburg, Ohio  
Livingston Wood Manufacturing, Ltd. .... Tillsonburg, Ontario, Canada  
Love Mfg., Inc. .... 608 South Commerce Street, Wichita, Kansas  
Pennsylvania Box & Lumber Co. .... Terwood Road, Willow Grove, Pa.  
Utility Crate Corporation .... 1985 E. 16th Street, Los Angeles 21, Calif.

— an inquiry to any of these companies will get prompt attention



The • WATKINS CONTAINER • Manufacturers

## TRUCKERS CONTINUED

they are protected against all normal wear and tear in transit. He then identifies his shipments with the red and yellow Safe Transit label.

"You're familiar with the NST label — but let's read its message once more: 'Pre-tested Safe Transit Shipment', it says. 'The manufacturer certifies that this PACKAGED PRODUCT meets the pre-shipment testing standards established by the National Safe Transit Committee and will withstand NORMAL transportation and handling hazards.' And then in

large type at the bottom — 'Make Safe Handling Your Job!'

"Now, when shippers go to this effort and expense to package their shipments carefully, they naturally aren't happy when those shipments are still damaged. They have done their part and they expect that we will do our part.

"And you can't blame the manufacturer for saying, Well, we've done everything possible to safeguard our freight, but (your company) still smashes it up. Guess all we can do now is change carriers."

*'That's the sort of thing we just can't afford to have happening. So let's make this label a reminder to give all shipments careful handling.'*

The inclusion of the Safe Transit pre-shipment testing story in ATA's Freight Claim Section "Poster Plus" Program, is another example of how industry and carriers are cooperating in the National Safe Transit Program. It is this kind of teamwork — industry and carriers both doing their part — that is realizing substantial reductions in in-transit damages for Safe-Transit-Certified manufacturers.

## NST's contribution to better packaging cited

here's what the members attending ATA's last annual national Freight Claim Council were told about NST and its benefits.

IN a report of the executive secretary of the American Trucking Association to the annual membership meeting of ATA National Freight Claim Council, John M. Miller (executive secretary) urged members to get solidly behind the National Safe Transit program for the mutual benefit of all shippers and carriers. Following are selected excerpts from his report.

"In the annual perfect shipping campaigns much has been said by carrier representatives in regard to the need for better packaging. One of the greatest contributions to the achievement of perfect shipping by better packaging has been made by the National Safe Transit Committee and its National Safe Transit Program. As most of you already know, the National Safe Transit was originally sponsored by the Porcelain Enamel Institute primarily for the purpose of reducing damages on shipments of appliances. This Committee after considerable research and in cooperation with all transportation agencies established certain procedures and methods for pre-shipment testing of packaged products. These tests simulate the actual hazards which products will normally encounter from the end of the assembly line to the ultimate purchaser

and user of the product. If the packaged product can withstand these tests, there is every reason to believe that it will reach the consumer in undamaged condition. Many of our leading manufacturers in the appliance field and more recently in other fields have subscribed to this program and adopted these prescribed pre-shipment tests. The National Safe Transit Program, however, is not merely a one-way street for manufacturers. All types of carriers are tied into this program, and it is our obligation and pledge that we will instruct our own employees that shipments carrying the Safe Transit label will be accorded the best possible handling.

"In June, 1951, our national associations awarded a plaque to the National Safe Transit Committee for its outstanding contribution to safe transportation, an award justly earned and deserved. The National Safe Transit program is no longer limited to manufacturers of appliances; manufacturers of other products have been invited to join in this program and to adopt the prescribed pre-shipment tests.

"The National Safe Transit Committee deserves our fullest cooperation. How can we help? We can

help by fully acquainting our industry employees with the meaning of the Safe Transit Label — that it means that the manufacturer of the product contained within the package carrying that label has done his part to assure that the product will reach destination without damage, and that it is our obligation to do our part by handling the shipment with care. We can also help by acquainting our shippers in the manufacturing industry with the National Safe Transit Program and the advantages to be gained through membership and by encouraging use of the label by those who subscribe to the program.

"The National Safe Transit Program has been established solely for the purpose of promoting perfect transportation. This program is not subsidized in any manner by any of the existing modes of transportation. It is financed solely through the sale of the label to its subscribers. It is our opinion that all concerned with transportation should extend to the National Safe Transit Committee and its program the fullest cooperation and assistance. We believe that the Committee and its efforts should be given greater recognition during the annual perfect shipping month campaign and possibly given the leading role in this activity."

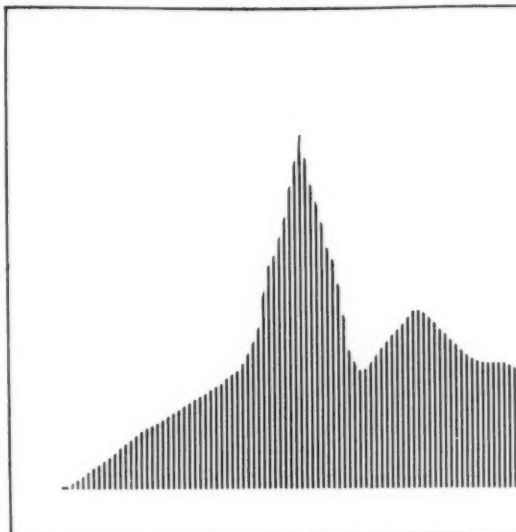


# NST Puts Protection into National Packaging-Shipping

## Admiral sold on pre-testing products

Sirs: . . . we, manufacturing Admiral appliances here in the midwest, feel it would be next to impossible to operate a plant of this type efficiently — as far as condition of products reaching the customer is concerned, without the pre-shipment testing of our products. We believe we have accomplished as much, with our pre-testing, in correcting production errors and also weak points in engineering, as we have in elimination of shipping damages. The accompany-

.7  
.6  
.5  
.4  
.3  
.2  
.1  
.0



• 1956 finish

J F M A M J J A S O N D

## Why These Manufacturers Joined the Program

1. Pre-shipment testing is a valuable check of product quality, and often results in cost saving through product improvement.
2. Pre-shipment testing assures proper package design and eliminates wasted costs resulting from "over packaging."
3. Pre-shipment testing assures safe delivery of finished products under any normal handling conditions.
4. Carrier handlers recognize the NST-labeled products as properly packaged merchandise.
5. NST-labeled products build dealer-distributor good will. The label proclaims that the manufacturer has taken all necessary protective measures now known to shipping science to reduce damage losses to the products he ships.

## Here Is How Easy It Is for You to Participate in this Voluntary Cooperative Program

1. Install the simple inexpensive pre-shipment testing equipment, and test your packaged products in accordance with the test procedures.

— or —

Submit your packaged products to one of the NST-certified laboratories for test.

2. After the packaged products have successfully passed the prescribed tests, apply on your company letterhead to the National Safe Transit Committee headquarters, 1346 Connecticut Ave., N.W. Washington 6, D.C., for certification.

ST-6



## Another Safe Transit shipment for Roper

One of the leaders in the development of the national safe transit program — former engineering director Everett Shands took part in the early development work of NST committee — the Geo. D. Roper Corp., at Rockford, Ill., has an extensive success story as a participant in the national safe transit program. During the engineering development of all Roper products, Vice President E. J. Sorby points out, one of the most important phases is the subjecting of the finished product to safe transit pre-shipment testing. Exaggerated tests beyond the normal employed at this point to highlight any potential weakness in construction of either the package, or the product itself. Moreover, Roper asserts, the regular production of Roper appliances is subjected to periodic testing on a random selection basis under the direct supervision of the Roper quality control supervisor.

APRIL • 1956 finish

## picture

chart is indicative of the low fractional per cent of transit damage, with average of around two and one half per cent of one per cent. We are sure that this could only have been accomplished through pre-shipment testing. We were having difficulty with glass shelves breaking on our pre-testing. Through experiments, this has been eliminated, while improving the packing, and reducing cost, at the same time. On our electric range we have improved the packing, reducing packaging cost by approximately \$3.00 per unit.

**Walter S. Humphrey**  
Midwest Manufacturing Corp.  
Statistical Quality  
Control Coordinator



### Maytag reports \$76,919 Savings Result of Program

Pinpointing with his finger the symbol that resulted in great packaging and shipment savings during the past two years is R. H. Thompson, above, general traffic manager for the Maytag Co., Newton, Ia. The National Safe Transit label is being attached to another shipment of the Maytag automatic washers. Maytag, which has set up quite

extensive plant testing procedures, and quality control checks, reported savings of \$161,627.82 for the last nine months of 1954 against a cost of \$44,115.11. For 1955, General Traffic Manager Thompson estimated savings at \$77,519.78, with an installation cost of about \$600.

### Reduced transportation problems

Sir: We can sincerely say that our transportation problems have been greatly reduced since using Safe Transit Labels.

**J. O. Swafford**  
Chief Draftsman  
Consolidated Industries, Inc.

### Heintz says NST "more than paid off" — transit damage claims materially reduced

Assurance of customer satisfaction is the most important facet of better packaging and shipment. Personnel at the Heintz Mfg. Co., Philadelphia, Pa. feel and the National Safe transit program a definite asset for such assurance. The pre-testing by a recognized testing container laboratory makes personnel reasonably sure products will arrive at the customer without damage. "Further-

more," Heintz Chief Inspector E. M. Butler asserts, "when our customers see the Safe Transit label applied to their package, it helps make better customer relations as they fully realize the steps that we have taken to insure safe delivery." While Heintz personnel have kept no detailed records on the savings resulting from their participation in NST, plant management is agreed that

there has been reduction in damage claims. And while the NST program has not resulted in any cost reduction in package cost, (as a matter of fact, there has been a slight increase as compared to original estimates), Inspector Butler reports the program has more than paid off for Heintz. Below are some of the packages which have been pre-tested for Heintz.

oper

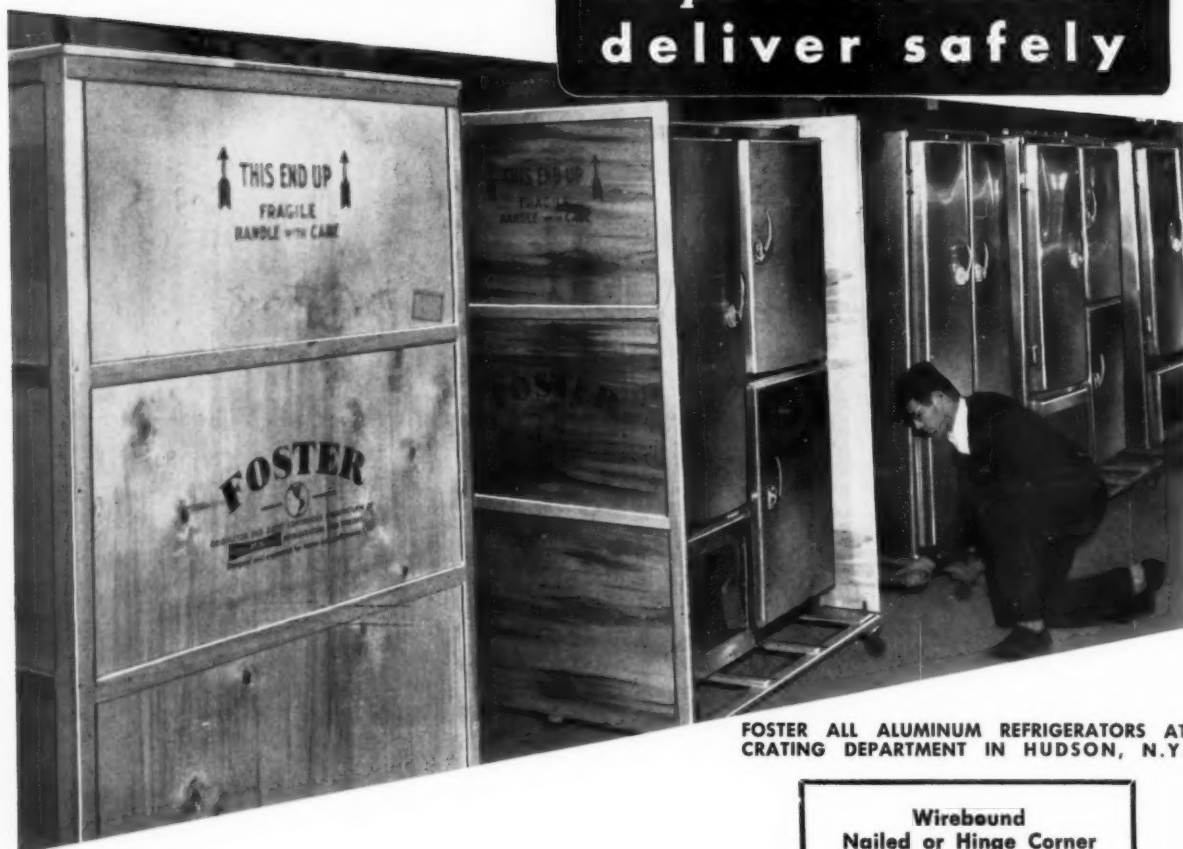
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**Industrial Packaging Seminar** — was conducted last summer by Pennsylvania Box & Lumber Co. and Packaging Service Co. of Willow Grove, Pa. Representatives concerned with traffic, materials handling and packaging from industrial firms were in attendance. Various types of containers were discussed, and demonstrations given. This is typical of the meetings that NST certified laboratories are conducting for the benefit of product manufacturers.

#### ACME STEEL DIV. APPTS.

Robert R. Warns has been appointed supervisor of the Los Angeles district office of the Dexion Div. of Acme Steel Co., Chicago, announced P. L. Dafoe, division manager.

J. Robert Sansom has been appointed manager of distributor sales of the division.

#### SEELY TO KAWNEER BOARD

Irving R. Seely, administrative vice president and general manager of the Architectural Products Div., has been named a member of the board of directors for Kawneer Co., Niles, Mich.

Charles B. Huizenga has been appointed to the new position of assistant secretary.

#### GOODWIN REPRESENTS PENNSALT IN CHICAGO

Ralph Goodwin, sales representative for Pennsylvania Salt Mfg. Co.'s Metal Processing Dept. in Peoria, Ill., and Indianapolis, Ind., has been assigned to serve additional accounts in Chicago, Joseph J. Duffy, sales manager, has announced.



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#### **NST certifications now include 218 companies, 46 laboratories**

The following companies have been certified under the National Safe Transit Program since the October, 1955, listing in finish:

- 192 — Argus Cameras, Inc.  
Ann Arbor, Michigan
- 193 — Conlon-Moore Corporation  
Joliet, Illinois
- 194 — Fairbanks, Morse & Co.  
Kansas City, Kansas
- 195 — Glenco Refrigeration Corporation  
Philadelphia, Penna.
- 196 — Royal Electric Mfg. Co.  
Chicago, Illinois
- 197 — Star Metal Mfg. Co., Inc.  
Philadelphia, Penna.
- 198 — The Coleman Co., Inc.  
La Porte Division  
La Porte, Ind.
- 199 — Fairbanks, Morse & Co.  
Westco Works  
St. Louis, Missouri
- 200 — Ortman-McCain Company  
Chicago, Illinois
- 201 — Kelvinator of Canada, Ltd.  
London, Ontario, Canada
- 202 — Wells-Gardner & Co.  
Chicago, Illinois
- 203 — Allis-Chalmers Manufacturing Co.  
Pittsburgh, Penna.
- 204 — Buckeye Aluminum Division  
Mardigian Corporation  
Wooster, Ohio
- 205 — Chrysler Airtemp  
Dayton, Ohio
- 206 — Belvedere Products, Inc.  
Belvidere, Illinois
- 207 — Plastic Fabricating Co., Inc.  
Wichita, Kansas
- 208 — Lawson Manufacturing Company  
New Kensington, Penna.
- 209 — General Electric Company  
High Voltage Switchgear Dept.  
Philadelphia, Penna.
- 210 — Sentinel Radio Corporation  
Evanston, Illinois
- 211 — D. W. Whitehead Manufacturing Corp.  
Trenton, New Jersey
- 212 — Hillside Metal Products, Inc.  
Newark, New Jersey
- 213 — Lakeside Mfg. Co.  
Milwaukee, Wis.
- 214 — Lewyt Air Conditioner Corp.  
Brooklyn, New York
- 215 — Pryne & Company, Inc.  
Pomona, California
- 216 — Foster Refrigerator Corp.  
Hudson, New York
- 217 — Acme Industries, Inc.  
Jackson, Mich.
- 218 — Morrison Steel Products,  
Buffalo, New York

#### **Latest laboratory certifications:**

- 44 — Hoerner Boxes, Inc.  
Keokuk, Iowa
- 45 — Pomeroy Mfg. Co., Inc.  
Vincennes, Indiana
- 46 — Institute of Packaging  
Southern Methodist University



Incline  
impact  
tester



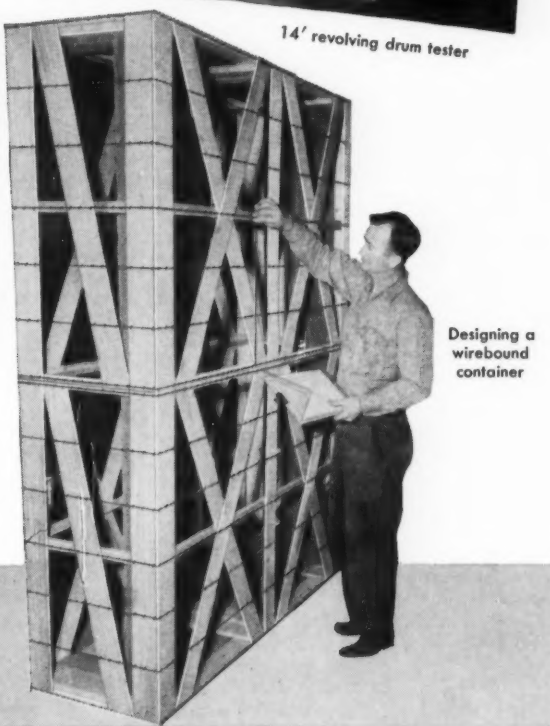
14' revolving drum tester



Drop tester and 7' revolving drum tester



Vibration tester



Designing a  
wirebound  
container

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tenna . . . major appliances . . . component parts in bulk.

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### FOR SALE—USED EQUIPMENT

**PHOSPHATIZING MACHINE and SPRAY BOOTH**—1953 Stevens automatic phosphatizing or plating machine, excellent condition. Complete with motors, blowers and duct work. Fully automatic with 0-20 minute timer. \$25,000 new, sale price: \$9,500.

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Tranter Mfg., Inc., 735 E. Hazel St.,  
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**COVER COAT EQUIPMENT**—Ferro engineered installation comprising the following:

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One 40,480 CFM recirculating air supply system for spray sections. Floor area of pressure room is 24' wide x 45' long.

One brushing installation comprising 9 Binks 3'0" x 4'0" brushing tables complete with Dyna exhaust and collector unit.

One Alvey Ferguson belt inspection conveyor 168 ft. long x 32" wide.

All of the above equipment has been dismantled into readily re-assembled sections, cleaned, identified for re-assembly, and stored ready for shipment to a buyer's plant. It is complete with motors, pumps, drivers, duct, etc. Equipment installation drawings are available.

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